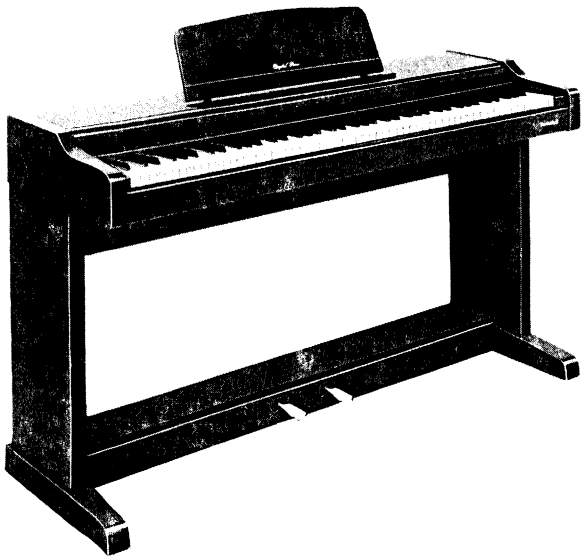
ORDER NO. EMID921378
A4

Service Manual

PCM Digital Piano

SX-PX71

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (X), (XT)



AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland	(XD):	Saudi Arabia, Kuwait
(EF):	France, Italy, Belgium	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain, Portugal, Greece	(XT):	Taiwan

■ Specifications

KEYBOARD	88 KEYS (POLYPHONIC 32~16 NOTES)
SOUNDS	GRAND PIANO, UPRIGHT PIANO, E PIANO 1, E PIANO 2, HARPSI, PIPE ORGAN
PEDAL	SOFT, SUSTAIN
DIGITAL CELESTE	○
REVERB	○
TRANSPOSE	G~C~F♯
DEMO	○
MIDI	MULTI TIMBRE, LOCAL CONTROL, OMNI ON, PROGRAM CHANGE, TRANSPOSE
MODE SET	PIANO TUNING, MIN RANGE, SOSTENUTO
OTHERS	POWER SWITCH, MAIN VOLUME, TUNE, MIDI TERMINALS (IN, OUT, THRU), PEDAL IN, LINE OUT (R/R+L, L), AUX IN (R/R+L, L), PHONES×2, AC IN, INITIAL KEY
OUTPUT	15 W × 2
SPEAKERS	16 cm × 1, 12 cm × 1
POWER REQUIREMENT	140 W, 80 W (NORTH AMERICA AND MEXICO)
	AC120/220/240V 50/60 Hz AC120V 60 Hz (NORTH AMERICA AND MEXICO) AC230V 50/60 Hz (EUROPE EXCEPT FOR UNITED KINGDOM)
DIMENSIONS (W×H×D)	136.5 cm × 97.4 cm × 45.5 cm (53-3/4" × 38-11/32" × 17-29/32")
NET WEIGHT	43.5 kg (95.9 lbs)
ACCESSORIES	DUST COVER, MUSIC STAND, AC CORD, STAND

* Specifications are subject to change without notice for further improvement.

Technics

CONTENTS

■ **PART I (INTRODUCTION)**

SAFETY PRECAUTION I-1
HOW TO ASSEMBLE THE PIANO I-2
KEYBOARD RANGES I-3
OPTIONS I-3
ARRANGEMENT OF CONTROL PANEL I-4
BASIC FUNCTIONS I-4
TERMINALS I-6
PARTS LOCATION I-7
INITIAL SETTING I-7
DISASSEMBLY INSTRUCTIONS I-8
MEASUREMENTS AND ADJUSTMENTS I-10
SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE I-10
ABOUT THE SELF-DIAGNOSTIC FUNCTION I-11
MIDI IMPLEMENTATION CHART I-13
PRECAUTIONS BEFORE SERVICING I-14

■ **PART II (SCHEMATIC DIAGRAM)**

WIRING CONNECTION DIAGRAM II-1
BLOCK DIAGRAM II-3
MAIN MAIN CIRCUIT BOARD II-6
MAIN MAIN CIRCUIT DIAGRAM II-9
TCF AS HP TRANSFORMER & FUSE, AMP & POWER SUPPLY AND HEADPHONES CIRCUIT BOARD II-13
TCF AS HP TRANFORMER & FUSE, AMP & POWER SUPPLY AND HEADPHONES CIRCUIT DIAGRAM II-17
MKB1 MKB2 MANUAL KEYBOARD 1 & 2 CIRCUIT II-20
JACK JACK CIRCUIT II-23
CPL CONTROL PANEL CIRCUIT DIAGRAM II-25
CPL CONTROL PANEL CIRCUIT BOARD II-27

■ **PART III (REPLACEMENT PARTS LIST)**

REPLACEMENT PARTS LIST (P.C.B. and Wiring Parts) III-1
CABINET PARTS LOCATION III-7
REPLACEMENT PARTS LIST (Cabinet Parts) III-9
PACKING III-11

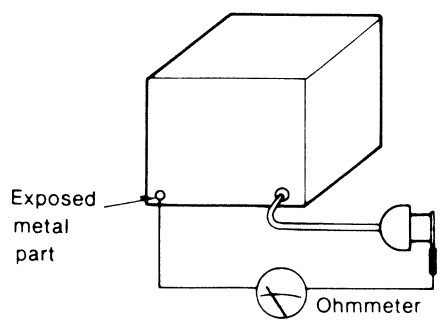
SAFETY PRECAUTION (This "safety precaution" is for the U.S.A. only)

• Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc. Measurements should range from 4 MΩ to infinity for all exposed parts.

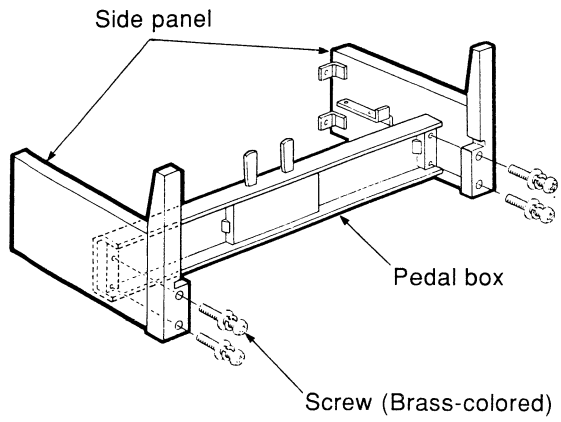


Resistance = 4 MΩ to ∞

HOW TO ASSEMBLE THE PIANO

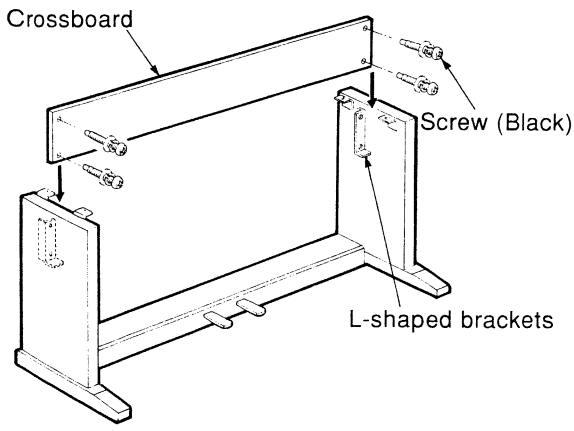
- To prevent the piano unit from falling off the stand, secure it firmly with the screws.

1 Assemble the side panels and the pedal box with the 4 brass-colored screws.



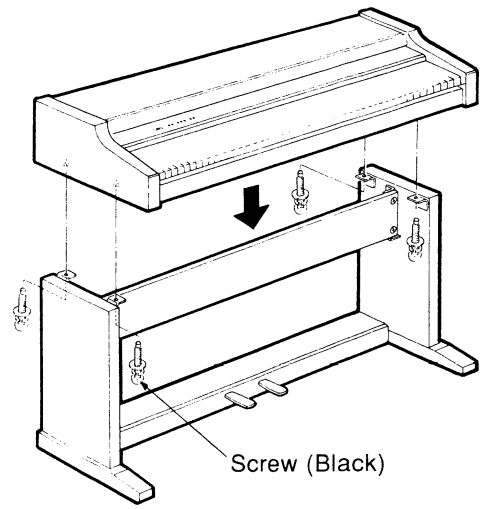
[Fig. 1]

2 Place the stand upright. Secure the crossboard to the front of the L-shaped brackets with the 4 black screws.



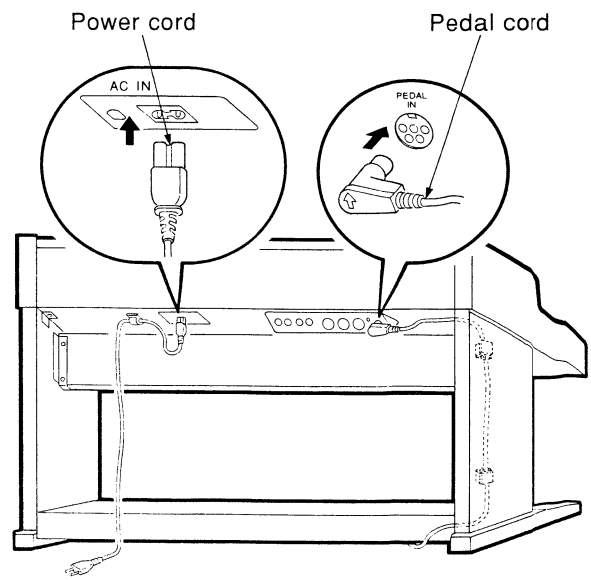
[Fig. 2]

3 Place the piano unit on the stand and secure it to the stand with the 4 black screws.



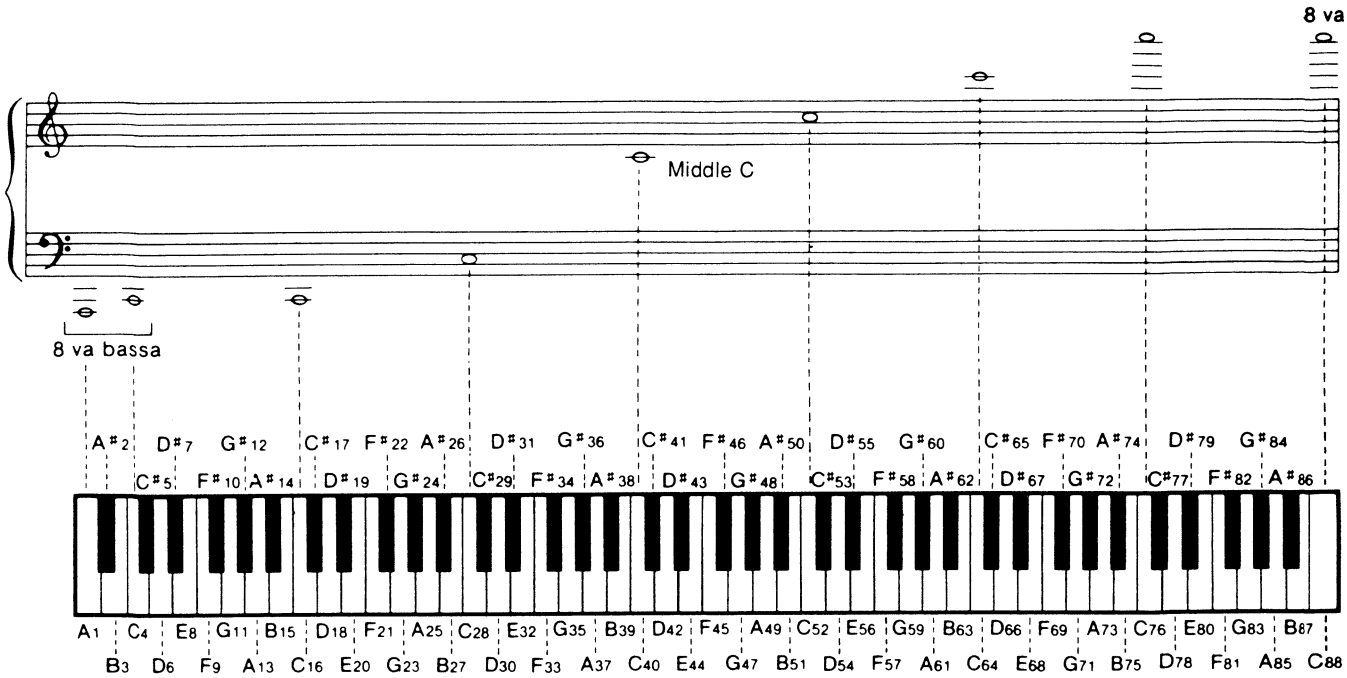
[Fig. 3]

4 Connect the pedal cord and power cord to their sockets located rear of the piano unit as shown below.

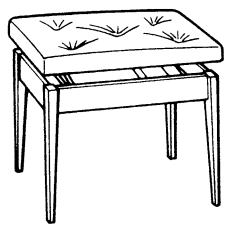


[Fig. 4]

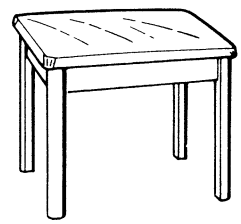
KEYBOARD RANGES



OPTIONS

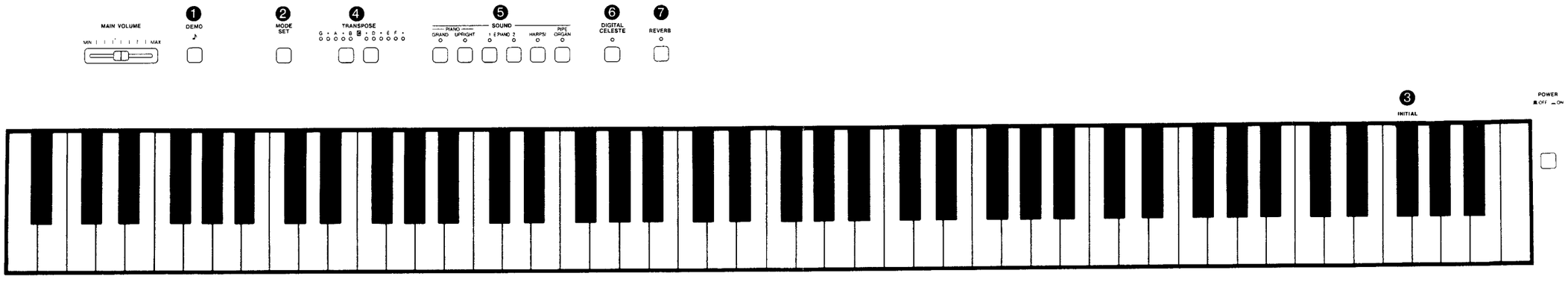


SZ-CP1
Bench



SZ-CP3
Bench

ARRANGEMENT OF CONTROL PANEL



BASIC FUNCTIONS

❶ DEMO
Automatic demonstration performances stored in the piano's memory introduce the various sounds available. Listen to all the demonstration tunes in order, or listen to the demo tune of a specific sound.

❷ MODE SET, ❸ INITIAL KEY
Used when selecting functions to set or adjust, including type of piano tuning, minimum range (volume), sostenuto, initialization, plus all settable MIDI functions.
- If the INITIAL KEY is pressed while the MODE SET button is depressed, the settings of the buttons, etc. will return to the initialized settings made by the manufacturer.

❹ TRANSPOSE
C is the standard setting, but you can raise or lower the key of the entire instrument within a one-octave range with these two buttons. The buttons are also used for adjusting the volume balance of mixed sounds.

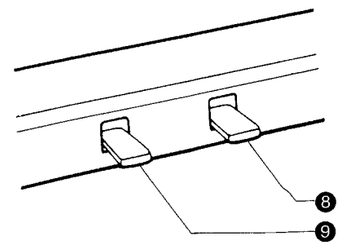
❺ SOUND
Select from 6 different sounds for the piano. You can mix sounds by selecting two simultaneously. All sounds feature Touch Response.

❻ DIGITAL CELESTE
Apply a celeste effect to give the sound greater depth. The setting is memorized independently for each sound.

❼ REVERB
Add a reverb effect to the sound.

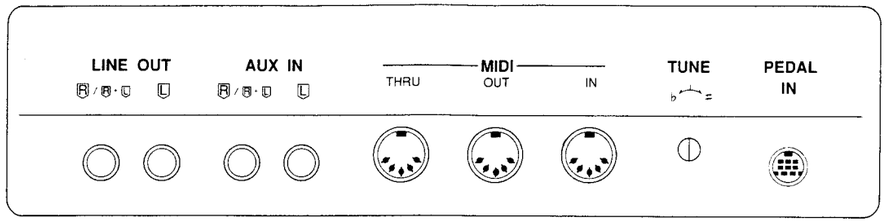
❽ Sustain pedal
The sound is sustained when a key is released while this pedal is depressed. For **PIANO** sounds, the tones of the 17 rightmost keys are automatically sustained.

❾ Soft pedal
Press the pedal for softer, muted sound. It can also be used as a sostenuto pedal. When used as a sostenuto pedal, and **PIPE ORGAN** is selected, the tones continue to sound for as long as the pedal is depressed.



TERMINALS

(On the back of piano)



LINE OUT (output level 1.5 Vrms, 600 Ω)
By plugging into an external high-power amplifier, the sound can be reproduced at a high volume. Or connect a tape recorder and use them as recording terminals. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

AUX IN (input level 0.5 Vrms; 33 kΩ)
Other instruments such as a rhythm machine or sound module can be connected to the piano so that the sound is output from the piano. To receive monaural sound, connect the other instrument to the **R/R+L** terminal. (Do not connect the **L** terminal.)

TUNE
During an ensemble performance with other instruments, fine adjustments of pitch can be made using this knob. The center position is standard pitch (A=440 Hz). The pitch is adjustable in a range of ±50 cents.

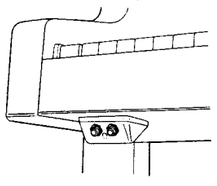
PEDAL IN
Connect the cord from the included stand to this terminal.

MIDI (Musical Instrument Digital Interface)
MIDI is the standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Digital Ensemble and instruments provided with MIDI terminals.

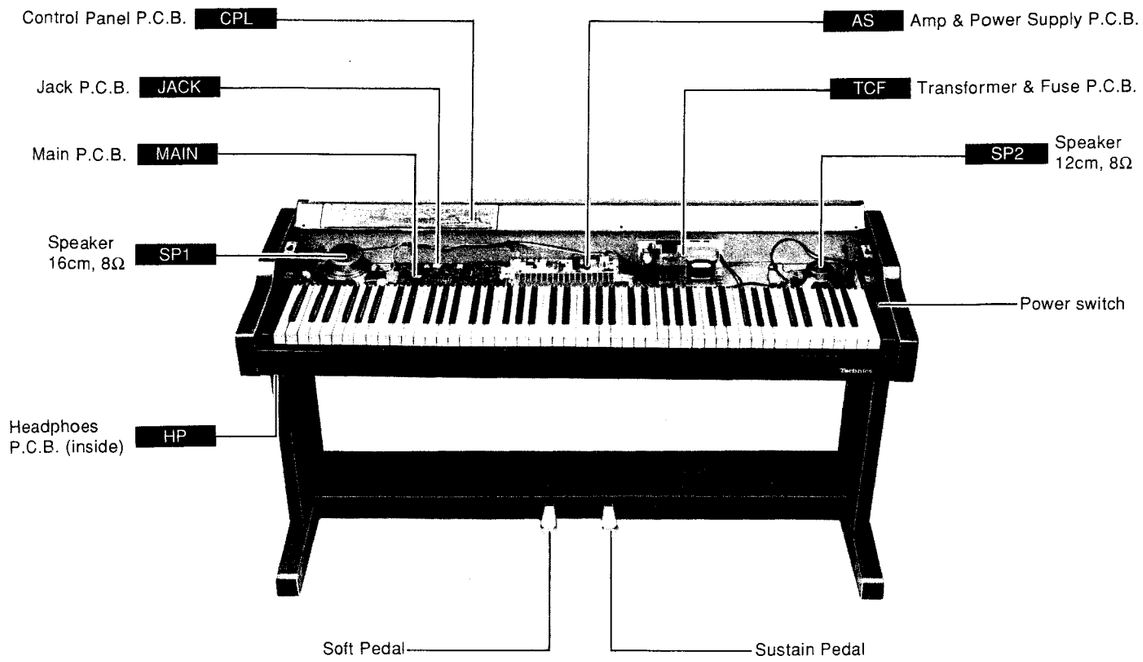
IN: The terminal that receives data from external equipment.
OUT: The terminal that transmits data from the piano to external equipment.
THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.

- Use a 5-pin DIN cord (less than 15m long) for these connections.

PHONES (∩) ×2
For silent practice headphones may be used. When plugged in, the speaker system is automatically switched off, and sound is heard only through the headphones.



PARTS LOCATION

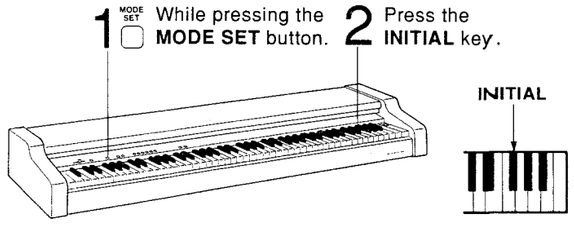


[Photo-1]

INITIAL SETTING

The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations. The selected sound and various functions, MIDI settings are initilalized with this operation.

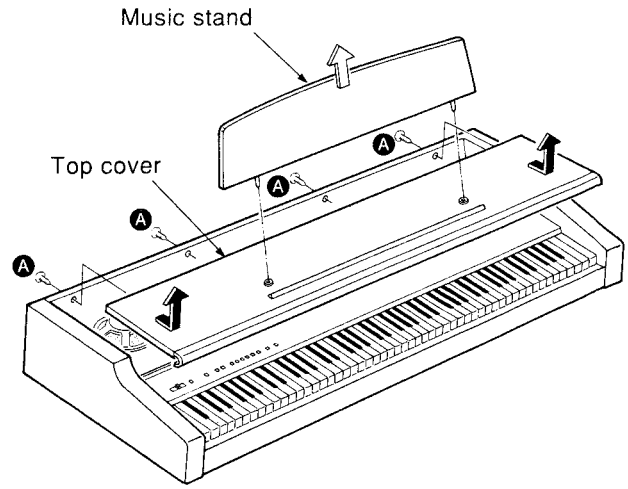
■ **INITIAL SETTING**
Press the **INITIAL** key while the **MODE SET** button is pressed. Or turn on the **POWER** switch while pressing the **INITIAL** key.



DISASSEMBLY INSTRUCTIONS

1 Removing the top cover

1. Remove the music stand.
2. Remove the top cover holding screws (Ⓐ 4 pcs.).
3. Slide the top cover forward and lift up.



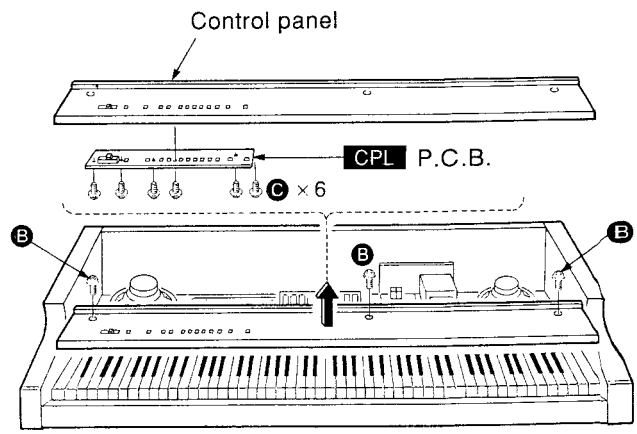
[Fig. 5]

2 Removing the control panel

1. Remove the control panel holding screws (Ⓑ 3 pcs.).
2. Remove the control panel as shown in Figure 6.

3 Removing the CPL P.C.B.

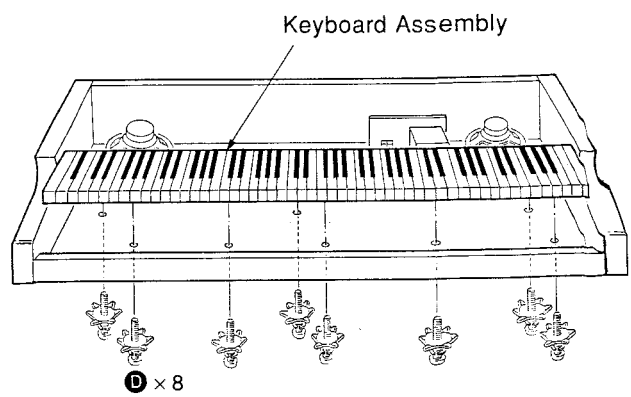
1. Remove the control panel (see step 2).
2. Remove the CPL P.C.B. mounting screws (Ⓒ 6 pcs.).



[Fig. 6]

4 Removing the keyboard assembly

1. Remove the control panel (see step 2).
2. Remove the keyboard ass'y holding screws located on the bottom of the cabinet (Ⓓ 8 pcs.).



[Fig. 7]

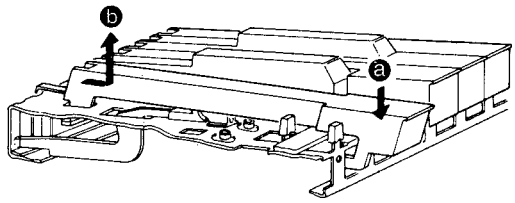
5 Key(s)

Disassembly

1. Remove the keyboard assembly (see step 4).
2. To release the key claw.
   - ⓐ Press the front of the key downward slightly.
   - ⓑ Press the rear of the key forward gently.
3. To remove the key, lift as shown in Figure 9.

NOTE:

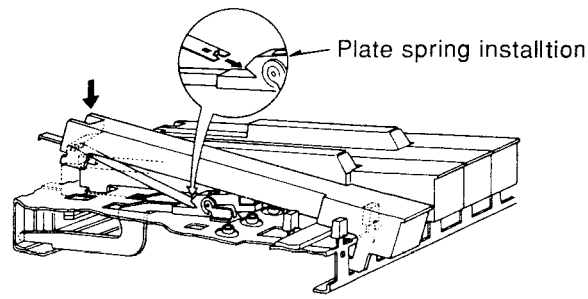
- The key claw is easily broken. Do not apply undue force. Should a key claw break, it can still be used; however, a replacement is recommended.
- If a black key is to be replaced it is necessary to remove both adjacent white keys.



[Fig. 8]

Assembly

1. Insert the front part of the key into the chassis.
2. Insert the plate spring into the hammer notch as shown in Figure 9.
3. While slowly lowering the key into the chassis,insert the plate spring into the notch at the rear of the key.
4. Carefully insert the key into the opening in the chassis and slide the key towards the rear to lock it in place.



[Fig. 9]

6 Removing the printed circuit boards.

- Remove the top cover (see step 1).

MAIN P.C.B.

1. Disconnect the 4 connectors.
2. Remove the MAIN P.C.B. mounting screws (Ⓔ 2 pcs.).
3. Release the claws of the 2 P.C.B. holders.

JACK P.C.B.

1. Disconnect the 2 connectors.
2. Remove the JACK P.C.B. mounting screws (Ⓕ 3 pcs.).

TCF P.C.B.

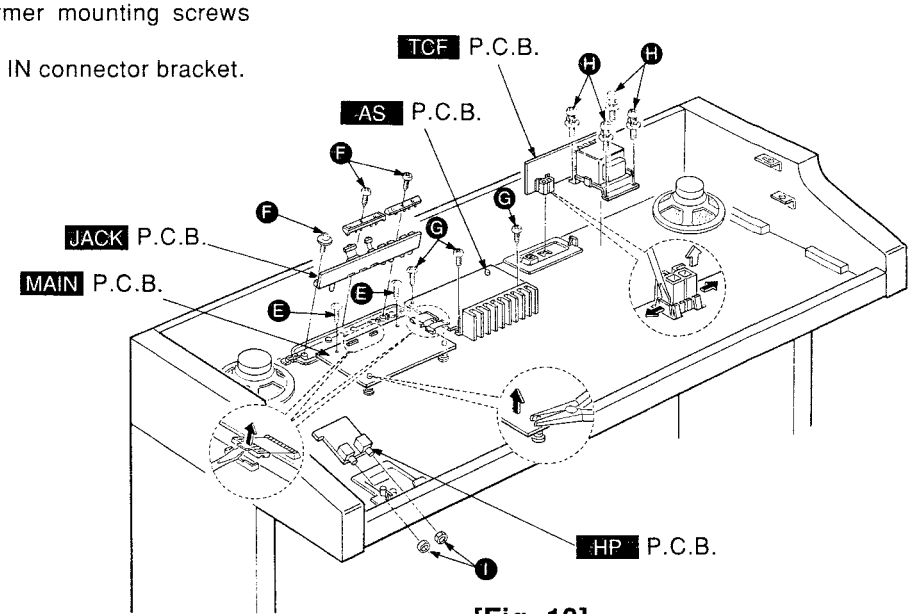
1. Remove the power transformer mounting screws (Ⓗ 4 pcs.).
2. Release the claws of the AC IN connector bracket.

AS P.C.B.

1. Disconnect the 2 connectors.
2. Remove the AS P.C.B. mounting screws (Ⓖ 3 pcs.).
3. Release the claws of the P.C.B. holder.

HP P.C.B.

1. Remove the keyboard assembly (see step 4).
2. Remove the headphone jack mounting nuts (Ⓘ 2 pcs.).



[Fig. 10]

MEASUREMENTS AND ADJUSTMENTS

■ **Measuring Equipment**

• Oscilloscope 20 MHz, 1:1 probe

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
D/A Converter offset	any position	Oscilloscope	MAIN P.C.B.	VR1	IC18 Pin ⑦	0V ±5 mV
	1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to IC18 Pin ⑦ on MAIN P.C.B. 2. Turn VR1 to adjust the voltage to zero.					

MEMO

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

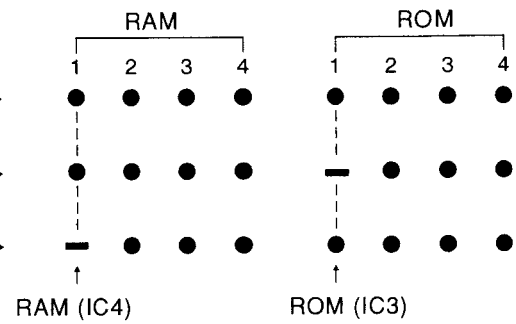
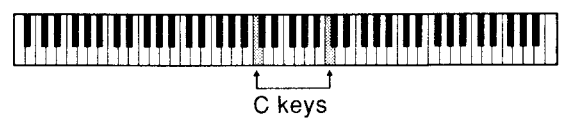
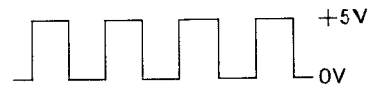
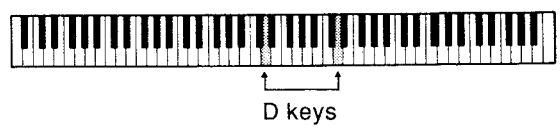
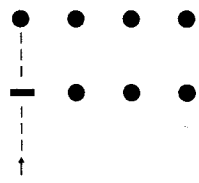
Phenomenon	Remedy
No sound is produced when the keyboard is played.	• No sound is produced if the **MAIN VOLUME** is set to **MIN**. Use the sliding control to set the volume to an appropriate level. • If the MIDI LOCAL CONTROL is set to off, set it to on.

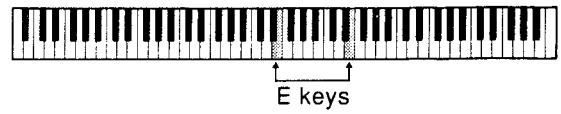
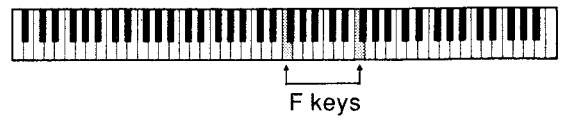
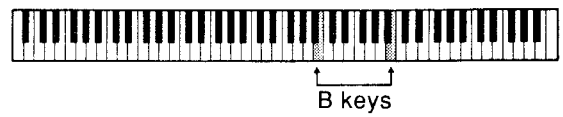
■ **About the back-up memory**

The selected sound and various functions, MIDI settings remain in the memory for about one week after the **POWER** is turned off. If you wish to return all memories and settings to their initialized status, while pressing the **MODE SET** button, press the **INITIAL** key on the keyboard. Or, press the **POWER** on and hold the **INITIAL** key at the same time.

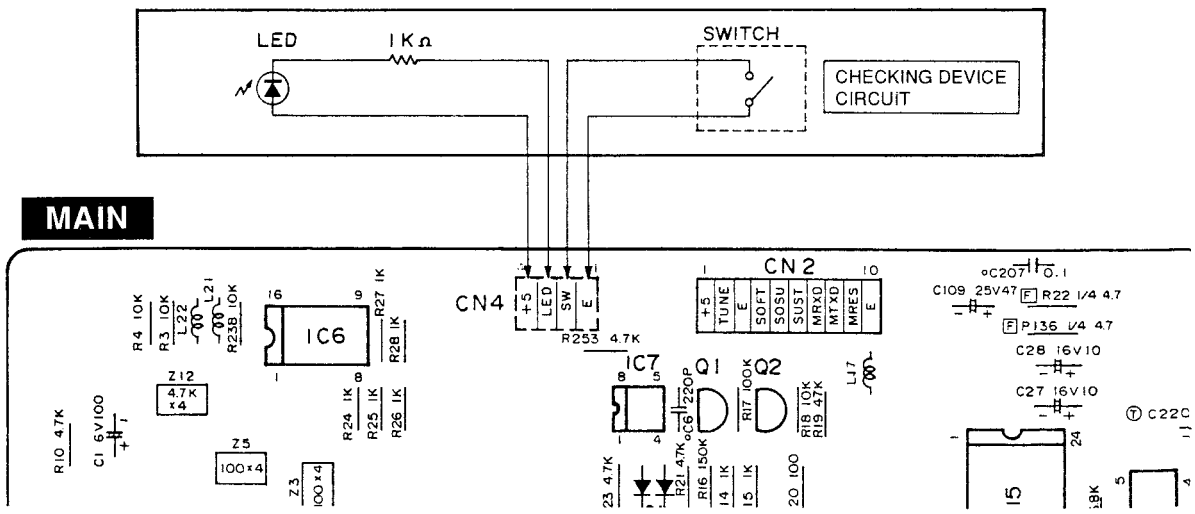
ABOUT THE SELF-DIAGNOSTIC FUNCTION

This model has some self-diagnostic capabilities. When set to the self-diagnostic mode, operation of various components can be verified by following the procedures in the chart below.

<table>
<tr><th>No.</th><th>PCB</th><th>Component(s) Under Test</th><th>Procedure</th></tr>
<tr><td>1</td><td>MAIN</td><td>RAM (IC4), ROM (IC3) check</td><td>1. Connect the CHECKING DEVICE (refer to page I-12) to CN4 on the MAIN PCB, and turn on the CHECKING DEVICE switch.
2. Turn on the power switch.</td></tr>
<tr><td></td><td></td><td colspan="2">When the power switch is turned on, the LED of the CHECKING DEVICE flashes on and off. The first 4 flashes are for the RAM check, and the latter 4 flashes are for the ROM check. The flash number corresponds to the RAM number and ROM number; since one RAM and one ROM are used in this model, flash 1 of the first 4 flashes corresponds to the RAM (IC4) check, and flash 1 of the second 4 flashes corresponds to the ROM (IC3) check. If the part is defective, the flash time for that part becomes longer.
Examples
1. RAM OK, ROM OK
2. RAM OK, ROM defective
3. RAM defective, ROM OK
Note: ▬ indicates long flash time.
 
</td></tr>
<tr><td>2</td><td>MAIN</td><td>Gate array (IC2) check</td><td>While pressing two C keys simultaneously, turn on the power switch.
 
</td></tr>
<tr><td></td><td></td><td colspan="2">Monitor pins 46~48 (DL6~DL4) of IC2 on an oscilloscope, and check whether incremental data (see figure) is output.
 
</td></tr>
<tr><td>3</td><td>CPL</td><td>Gate array (IC1) check</td><td>1. Connect the CHECKING DEVICE to CN4 on the MAIN PCB. (The Checking Device switch should be off.)
2. While pressing two D keys simultaneously, turn on the power switch.
 
</td></tr>
<tr><td></td><td></td><td colspan="2">When the power switch is turned on, the LED of the CHECKING DEVICE flashes. The LED flashes 4 times, the first flash corresponding to the IC1 check. If IC1 is defective, the first flash will be longer.
1. IC1 OK
2. IC1 defective
 
</td></tr>
</table>

No.	PCB	Component(s) Under Test	Procedure
4	MAIN	Wave ROM (IC11) check	1. While pressing two E keys simultaneously, turn on the power switch. 2. Select the GRAND PIANO sound. 
		When set to the self-diagnostic mode, the Wave ROM outputs a sine wave. If no sound is produced, or if the sound is distorted, when a key is pressed, the Wave ROM is defective.	
5	CPL	Control panel LED check	While pressing two F keys simultaneously, turn on the power switch. 
		Press the buttons on the control panel and confirm that the corresponding LEDs light.	
6	MKB	Keyboard ROM (IC2) check	While pressing two B keys simultaneously, turn on the power switch. 
		If the keyboard ROM (IC2) is OK, one confirming beep will sound. If it is defective, several consecutive error beeps will sound.	

■ Connection between serving CHECKING DEVICE and MAIN PCB



MIDI IMPLEMENTATION CHART

Digital piano [SX-PX71]

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1~16	1~16	memorized
	Changed	1~16	1~16	
Mode	Default	3	1, 3	memorized
	Messages	×	×	
	Altered	—	—	
Note Number		*21~108	0~127	
	True voice	—	*0~127	
Velocity	Note ON	○	○	
	Note OFF	× (9nH: V=0)	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	×	
Control Change	7	×	**○	volume
	64	○	○	sustain pedal
	66	○	○	sostenuto pedal
	67	○	○	soft pedal
	93	○	○	chorus (digital celeste)
Prog Change		○×	○×	
	True #	0~127	0~5	
System Exclusive		×	×	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Messages	Local ON/OFF	×	×	
	All Notes OFF	×	○	
	Active Sense	○	○	
	Reset	×	×	
Notes		○× .....Whether or not the data for each of these items is transmitted or received can be set. * Changes depending on the **TRANSPOSE** setting. ** Effective only in the MULTI TIMBRE mode.		

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO **Mode 3:** OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO

• This product adheres to MIDI specifications as published by the Japan MIDI Association. ○: Yes ×: No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to the difference in the timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. To measure the waveforms, first set this unit to the self-diagnostic mode (refer to page I-12, No. 4). The WAVE ROM output will then be output as a sine wave to facilitate the servicing check.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

■ Symbolic Marks

The symbolic marks for resistors and capacitors which used in this circuits are classified as following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4WATT, ±5% TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD—F—type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX—type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF—type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ—type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG—type)	[F]	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC—type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO—type)		

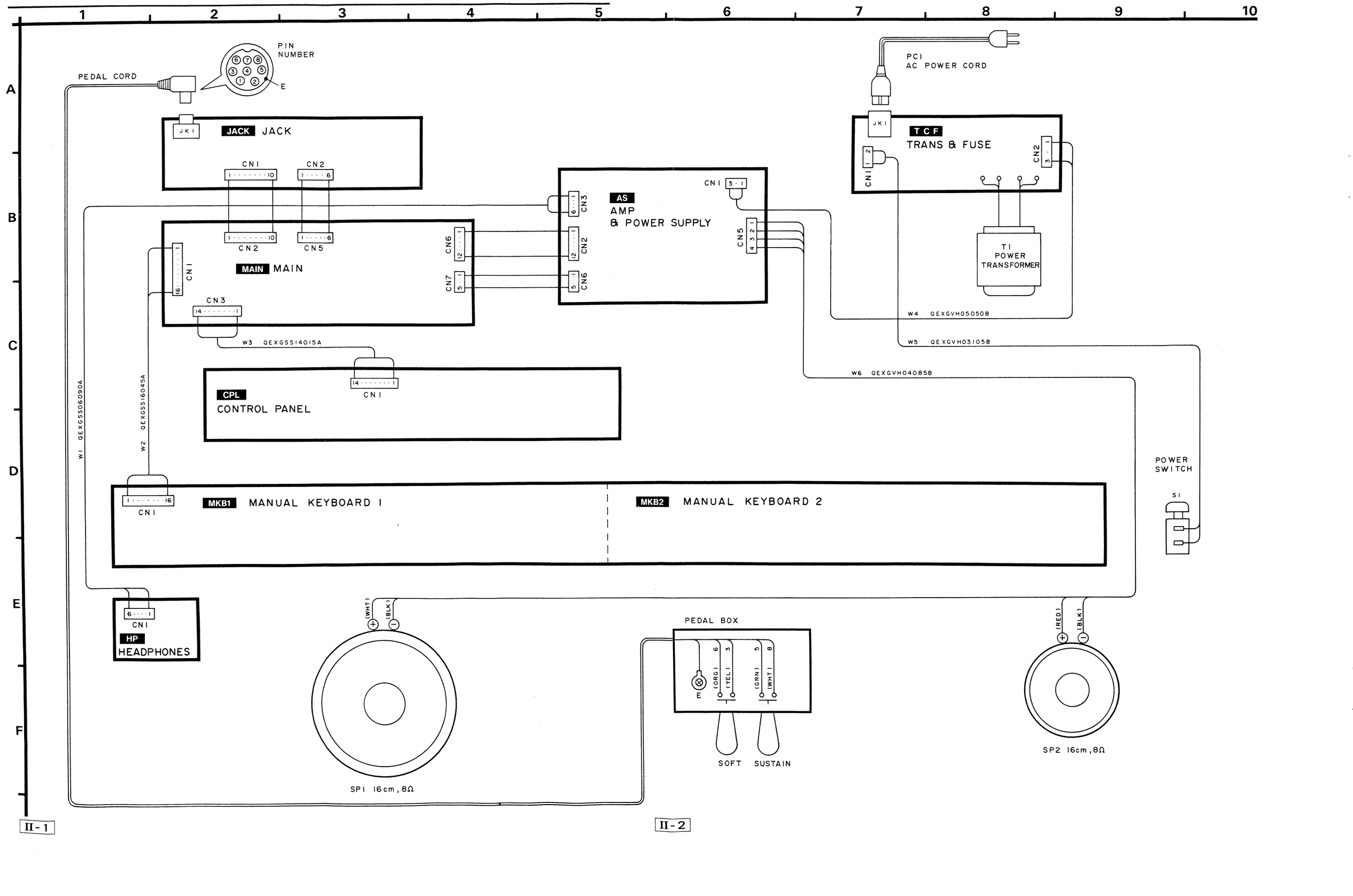
2. CAPACITORS
   - Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without symbolic mark are Aluminum Electrolytic Capacitors. (ECEA—type, ±20% Tolernace)

(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA__KN__type
Ⓨ	Non-Polarized Electrolytic (for Network System)	ECEA__Y__type
Ⓜ	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA__M__type
Ⓩ	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA__Z__type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS__type
Ⓣ	Metalized Plastic Film Capacitors (TF Series)	ECQV__type
Ⓣ	Polyester Film Capacitors	ECQB__type
○	Temperature Compensating Ceramic Capacitors	ECC__type
○	High-Dielectric Constant Ceramic Capacitors	ECK__type ECR__type
○	Ceramic Capacitors (Cylinder type)	ECBA__type
	Metalized Polyester Film Capacitors for Across the Line	ECQ__EW__type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES__type
	Multilayer Ceramic Chip Capacitors	ECUV__type

MEMO

WIRING CONNECTION DIAGRAM



BLOCK DIAGRAM

1 2 3 4 5 6 7 8 9 10

A B C D E F

Tone Signal Control Signal

MKB1 MKB2 MANUAL KEYBOARD CIRCUIT

Key Switches & Diodes

IC2 1K bit ROM (CS, SK, DI, DO)

IC1 Gate Array (ACK, DB0~DB7, WRST, REQ, VAL,RDY, KB00~KB21, KF0~KF3, KS0~KS3)

RST, IDE, REQ, VAL, RDY, DB0~DB7, ACK, CN1

CPL CONTROL PANEL CIRCUIT

IC1 Gate Array (AO, CPST, DB0~DB7, MVOL, +5, CN1)

Switches & LED'S

DI0 ~ DI7

RD6, RD7, RD9, RD10

Q1~Q4 LED Driver (TS0~TS3)

IC2,3 Buffer (DO12, DO14~16, DO18~DO21, DO12, DO14~16, DO18~20)

SI Power Switch

PCI AC IN

MAIN MAIN CIRCUIT

CN3 (MVOL, AO, CPST, DB0~DB7)

CN1 (ACK, DB0 ~ DB7, VAL/RDY, REQ, IDE, RST)

IC1 Microcomputer (P03, AO, X1, X2, P20, P26, INTP0, INTP1, READY, MREQ, R/W, REFRQ, CLKOUT, DO~D7, P15, RST, AO~A19, P00~P02, SNS, NM1, RESET, PMUT, TXDO, RXDO)

X2 IC7, Q1, Q2 A/D Converter

IC2 Gate Array (IOS1, EINTO, ARES, RDY, MREQ, R/W, REFRQ, CLKI, IOS4, CPST, DB0~DB7, IOS7, IOS8, IOS9, WR, RD, CS4, CS0, DO~D7, RST, A11~A19)

IC6 Multiplexer (MVOL, TUNE, SOFT, SOSU, SUST, COM, A, B, C, P00, P01, P02)

JACK JACK CIRCUIT

VR1 TUNE

JK1 PEDAL IN (SOFT, SOSU, SUST)

JK2 MIDI THRU (Q3)

JK3 MIDI OUT (Q2, Q1, MTXD, MRES)

JK4 MIDI IN (IC1 Photo Coupler, MRXD)

CN2 (SNS, RST, MTXD, MRES, MRXD)

IC8, D7~D8 Reset Circuit

IC3 ROM (1M bit) (A0~A16, OE, DO~D7)

IC4 RAM (64K bit) (OE, WE, A0~A14, CE, DO~D7, VCC)

IC8-4 (RST)

D4~D6 C19 Memory Back-UP

Address Bus

Data Bus

IC9 Tone Generator LSI I (PHREN, RST, AO~A2, MD8~MDI0, ALE, NWR, NRD, DB0~DB7, MDO~MD7, WOUD~WOU2, OUTSLO~OUTSL2, INHOUT, WOLO~WOL15, VR1 Offset Adj., A~C, INH)

IC15 IC18-2 D/A Converter

IC16,Z4 IC18-1 Level shifter

IC17 Panning Circuit (OSO~OS4, OS5, OS6, OS7)

IC20-1 Mixing

IC20-2 Mixing

IC21-2

IC22-1

IC21-1

(NH1) (NH2) (NH0)

Notch Filter

Notch Filter

CN1

JACK

CN2 (AUXL, AUXR)

IC10 Tone Generator LSI2 (ADO, AD0~AB15, PH2, 23, 34, 45, PH56,67,78,81, NS00~NS03, CB0~CB5, REQAB/CB, AD20, AD0~AD18, AD22, DT0~DT15, Address, Data)

IC11 WAVE ROM (8M bit) (OE, CE)

CPL CONTROL PANEL CIRCUIT

IC1 Gate Array

Switches & LED'S

DI0 ~ DI7

RD6, RD7, RD9, RD10

Q1~Q4 LED Driver

TS0~TS3

TS0 ~ TS3

IC2,3 Buffer

D012, D014~16, D018~20

D012, D014~16, D018~D021

MAIN VOLUME +5

AO CPST DB0~DB7 MVOL

CN1

CN3

TCF TRANS & FUSE CIRCUIT

POWER TRANSFORMER

Primaly Circuit

SI Power Switch

PCI AC IN

CN1 CN2 JK1

AS AMP & POWER SUPPLY CIRCUIT

IC2, Q1 +5V Switching Regulator

IC3 +15V Regulator

IC4 -15V Regulator

D3~D6 Rectifier

+5 +15 -15 SNS

CN1 CN6 CN7

IC9 Tone Generator LSI 1

RST PHREN

AO~A2 MD8 ~MDI0 ALE NWR NRD MDO ~MD7

DB0 ~DB7

WOLO ~WOL15

WOUD ~WOU2

OUTSLO ~OUTSL2

INHOUT

VR1 Offset Adj.

IC15 IC18-2 D/A Converter

IC16,Z4 IC18-1 Level shifter

A~C INH

IC17 Panning Circuit

OS0 ~OS4 OS5 OS6 OS7

IC20-1 Mixing

IC20-2 Mixing

IC21-2 (NH1)

IC22-1 (NH2)

IC21-1 (NH0)

IC10 Tone Generator LSI 2

AB0 ~ AB15

PH2, 23, 34, 45 PH56, 67, 78, 81

NS00 ~ NS03

CB0 ~ CB5

REQ18/CB

AD0

AD20 AD0~AD18 AD22

Address

IC11 WAVE ROM (8M bit)

Data

DT0~ DT15

IOS4 IOS7 IOS8 IOS9 CPST DB0 ~DB7 Gate Array

WR RD CS4 CS0 A11~A19

IC8-4 Memory Back-UP D4~D6 C19

ROM (1M bit) A0~A16

IC4 RAM (64K bit) A0~A14 VCC

D0~D7

Notch Filter

IC24-1 Low-Pass Filter

IC25 Dynamic Noise Reduction

IC24-2 Low-Pass Filter

AMPR AMPL AUXR AUXL LOL LOR PMUT

IC7-2 Q5,Q6

IC7-1 Q7,Q8

IC5-1 IC6-1 Equalizing

IC5-2 IC6-2 Equalizing

IC1-1 Power Amplifier (Rch)

IC1-2 Power Amplifier (L ch)

Q2 ~ Q4 Muting Control Circuit

HPL HPR HPS

SPR SPL

SP2 12cm,8Ω

SP1 16cm,8Ω

CN4 CN5

JACK

CN2

JK7 R/R+L

JK8 L

JK5 R/R+L

JK6 L

LINE OUT

AUX IN

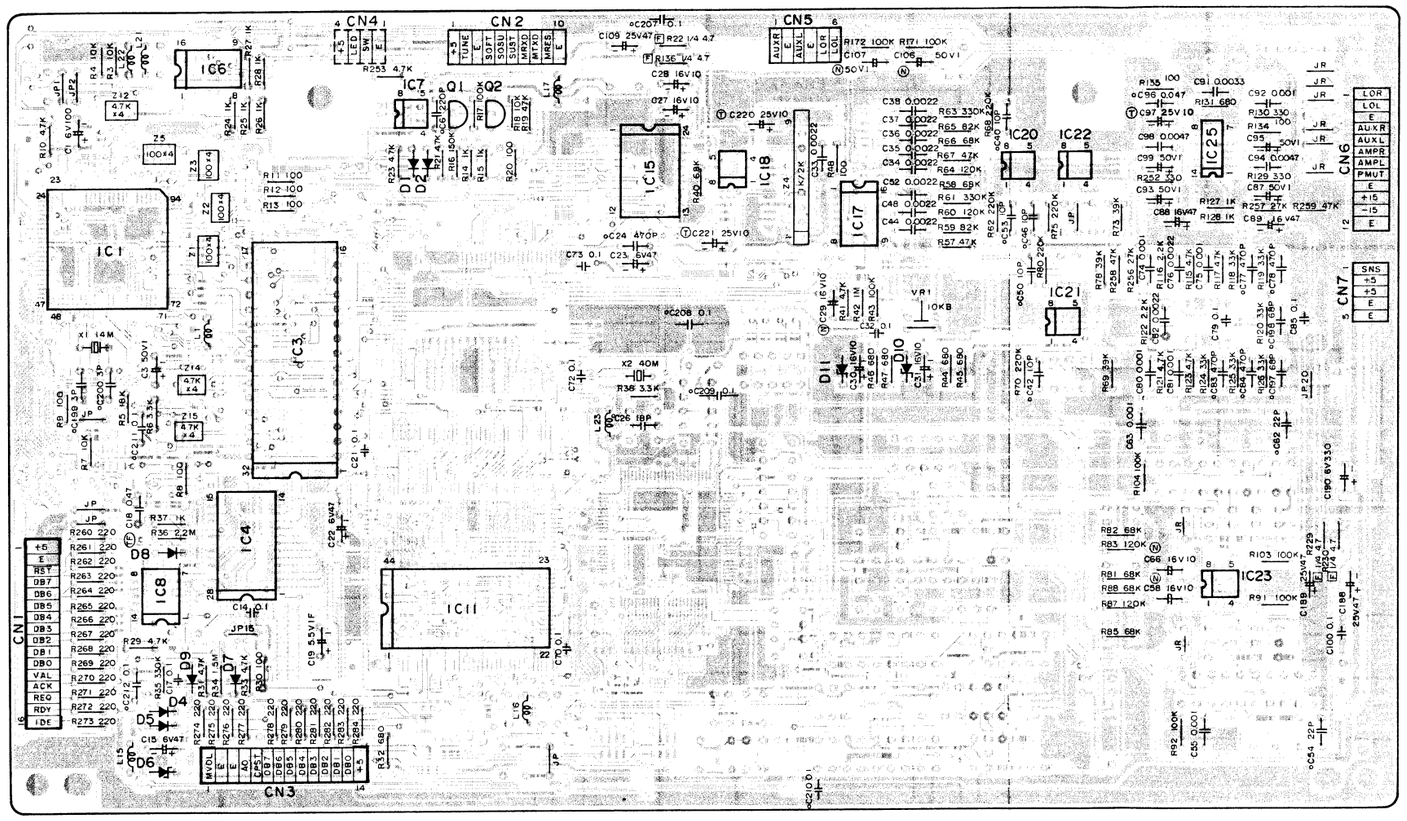
HP HEADPHONES

JK1 JK2

Headphones

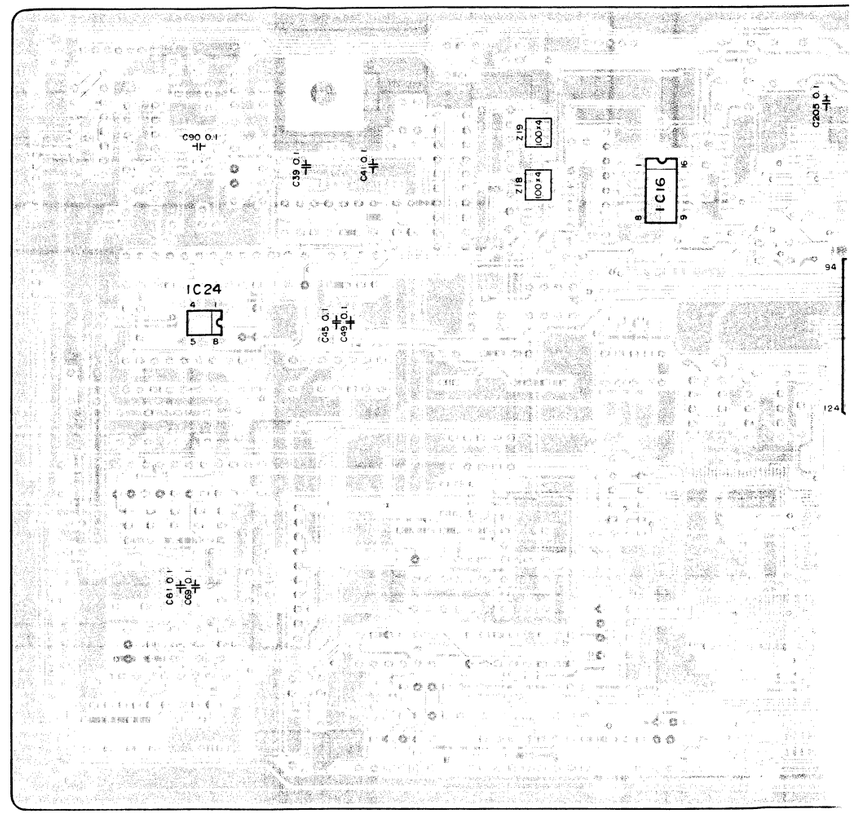
MAIN COMPONENT SIDE

Component Side
Foil Side



MAIN FOIL SIDE

Component Side
Foil Side

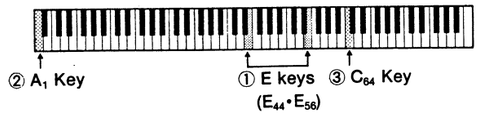


■ Measuring Conditions

Check Point ❻~❽, ⓯~⓲

Set to the self-diagnostic mode followings.

- While pressing two E keys (①) simultaneously, turn on the power switch.
- SOUND..... GRAND PIANO
- Main Volume..... Max
- Keyboard ..... A_1 (②)

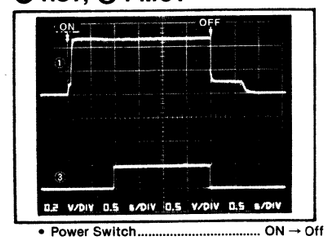


Check Point ❶~❺, ❾, ⓫

Set the initial setting mode (Refer to page Ⅰ−6)

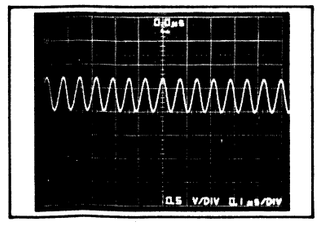
- SOUND..... GRAND PIANO
- Main Volume..... Max

❶ $\overline{RST}$, ❸ PMUT

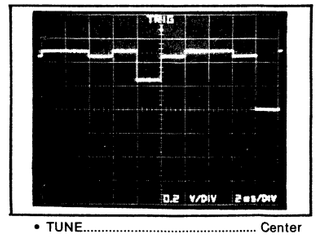


- Power Switch..... ON → Off

❷ X1, 14MHz

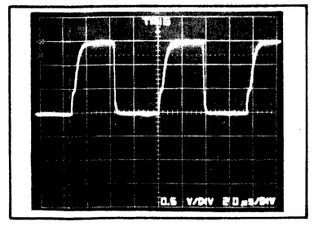


❹



- TUNE..... Center
- Pedal..... OFF

❺



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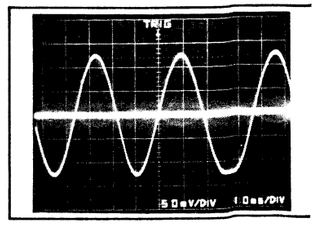
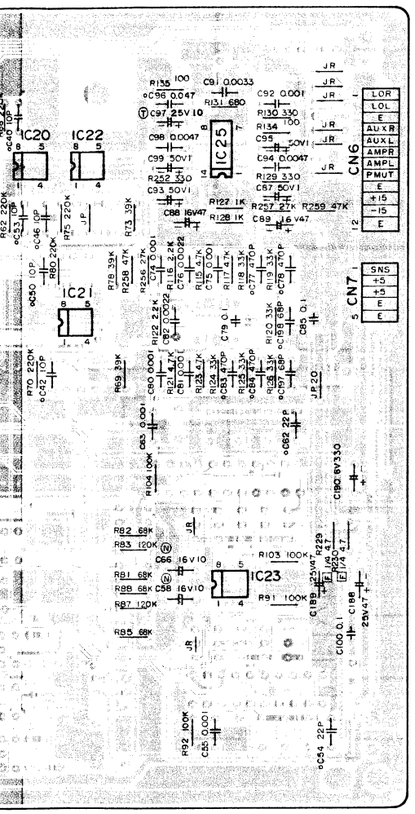


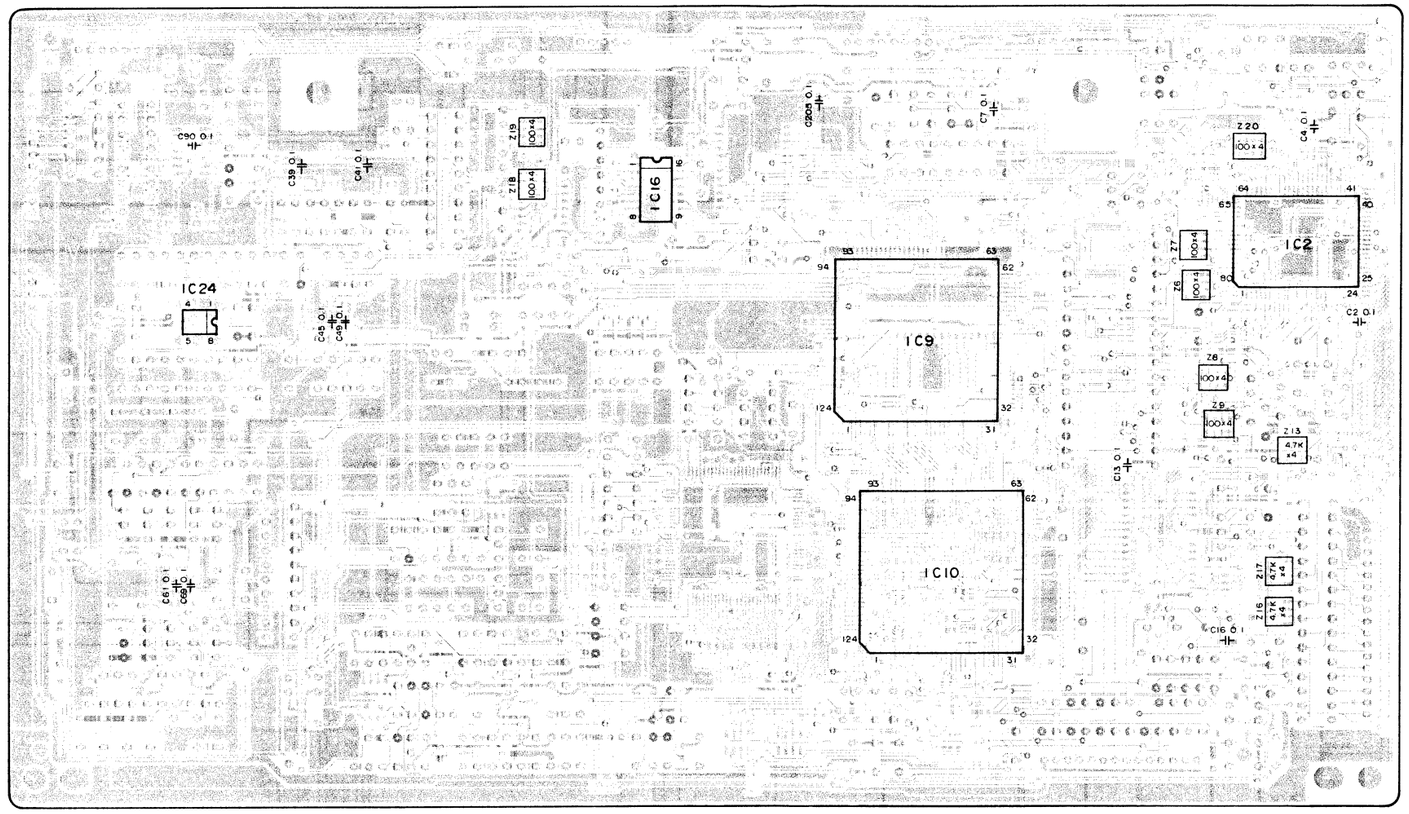
Component Side
Foil Side

MAIN FOIL SIDE

Component Side
Foil Side

SXPG210041





MAIN

NOTES:

- IC'S

IC1:	SVIGD70320GJ
IC2:	D65012GF-A79
IC3:	QSIGAPX73AX0
IC6, 16, 17:	T74H4051AF
IC7, 18:	M5238FP
IC8:	M74HC00FP
IC9:	MN73012PGC
IC10:	MN73013PGD
IC11:	QSIGM3C08113
IC15:	PCM55HP
IC20～24:	M5218AFP
IC25:	LM1894M

- TRANSISTORS

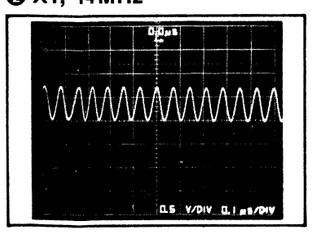
Q1:	2SJ105GR
Q2:	2SC2320LFG

- DIODES

D1, 2, 4, 5, 7～9:	MA165TA5
D6:	MA4051MTA
D10, 11:	MA4056

N → Off

❷ X1, 14MHz



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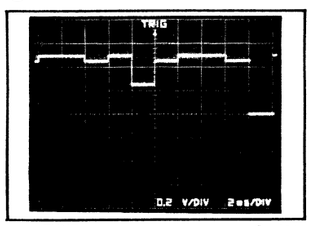
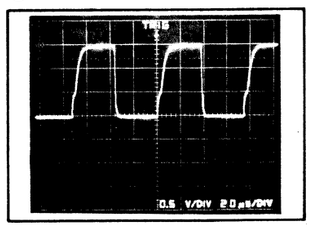


- TUNE..... Center
- Pedal..... OFF

❺



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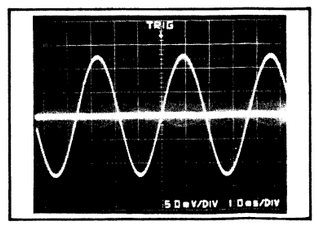

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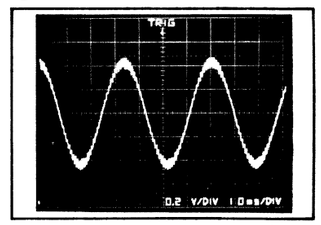

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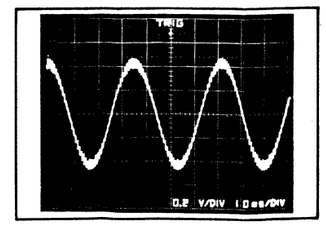

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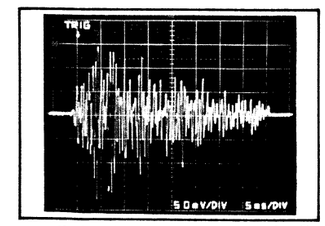
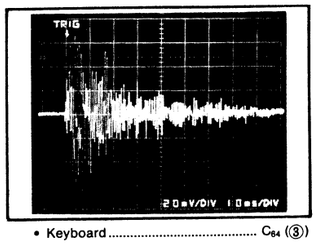


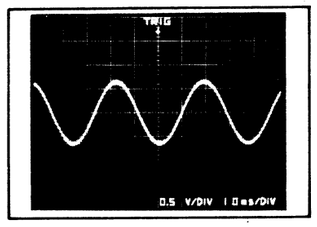
- Keyboard..... C_{64} (③)

MAIN CIRCUIT DIAGRAM



⓫

• Keyboard ..... C_{64} (③)



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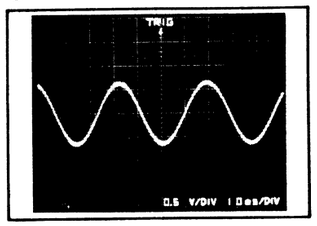

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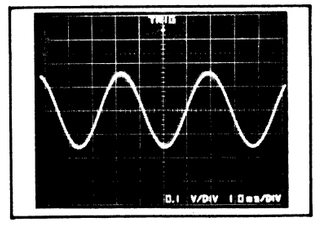

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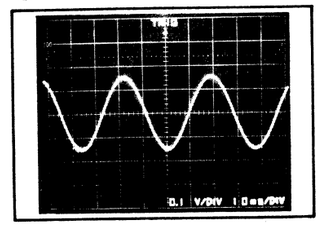
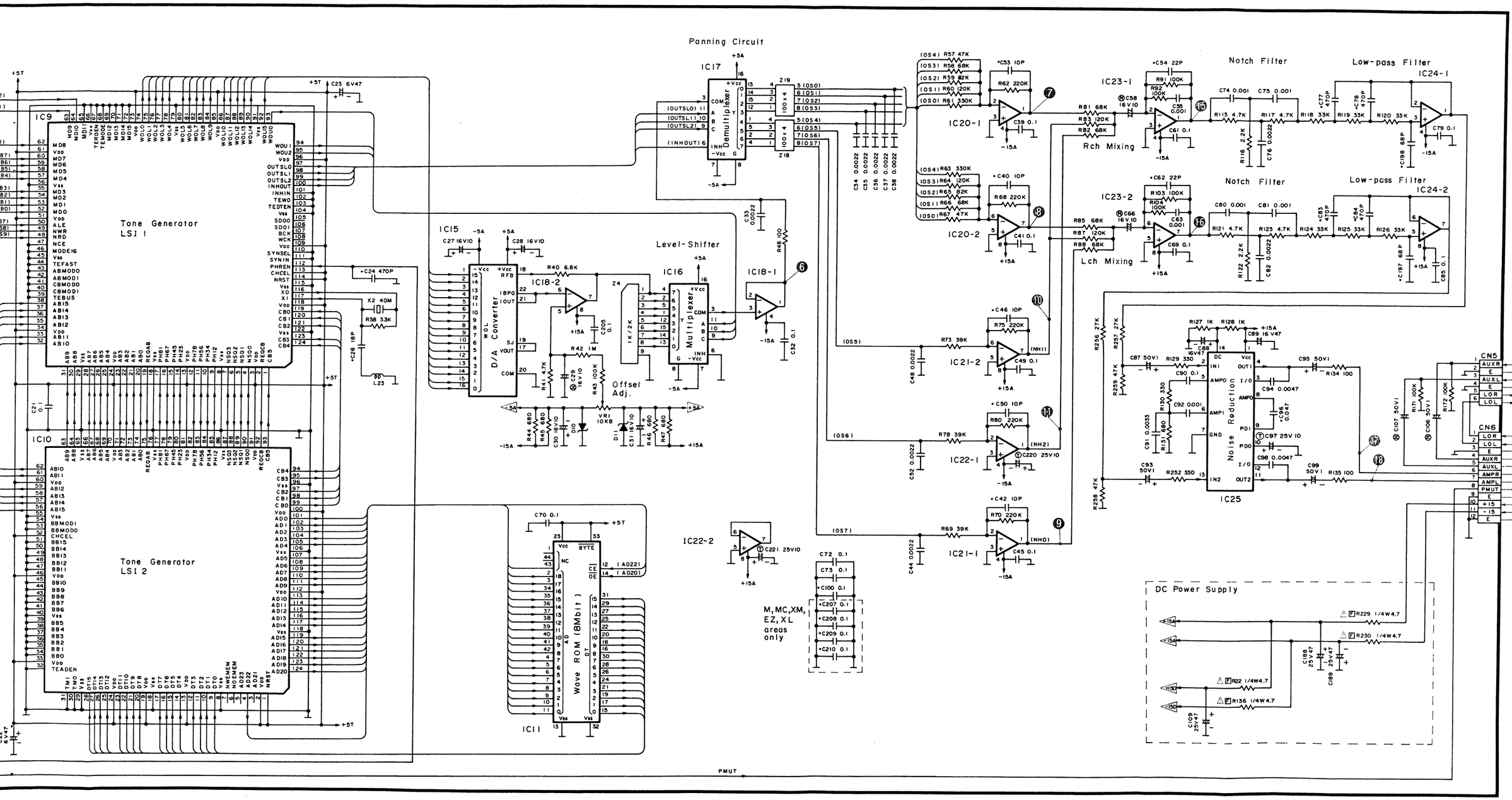
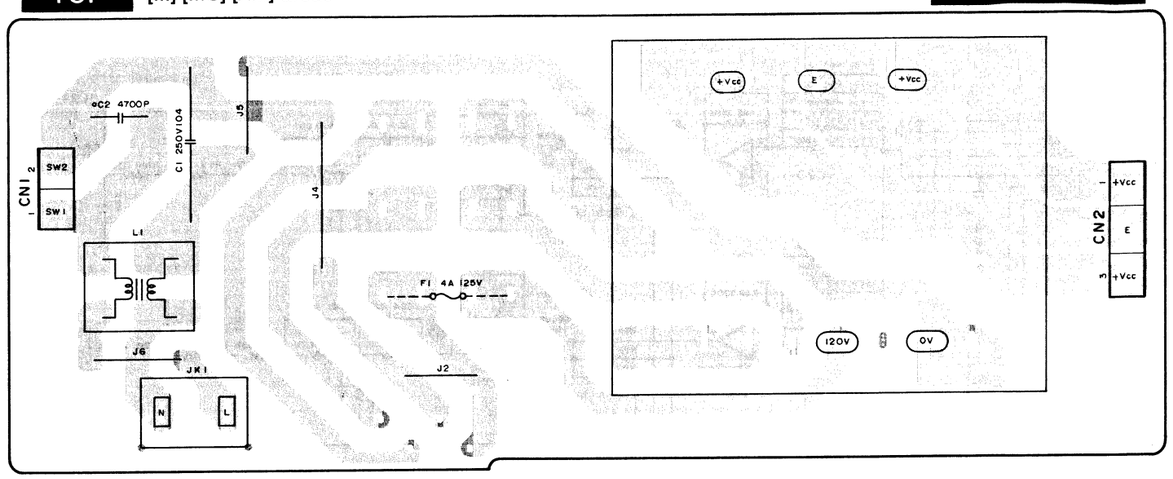


⓲


Panning Circuit
IC17
Demultiplexer
Z19
Z18
IC15
D/A Converter
WOL
Level-Shifter
IC16
Multiplexer
IC18-1
IC18-2
Offset Adj.
VR1 10KB
IC9
Tone Generator LSI 1
IC10
Tone Generator LSI 2
IC11
Wave ROM (8Mbit)
IC20-1
IC20-2
IC21-1
IC21-2
IC22-1
IC22-2
IC23-1
IC23-2
IC24-1
IC24-2
IC25
Notch Filter
Low-pass Filter
Rch Mixing
Lch Mixing
Noise Reduction
DC Power Supply
M,MC,XM, EZ,XL areas only
JACK
CN2
CN5
CN6
PMUT

TCF AS HP TRANSFORMER & FUSE, AMP & POWER SUPPLY AND HEADPHONES CIRCUIT BOARD

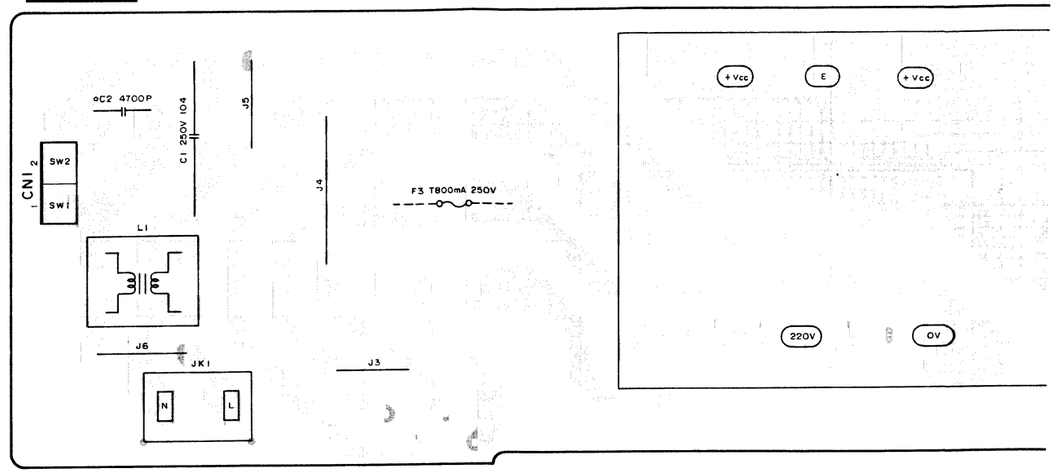
TCF [M] [MC] [XM] areas — SXPG211021



TCF

NOTE:
- FUSE
  F1: XBA1C40NU100

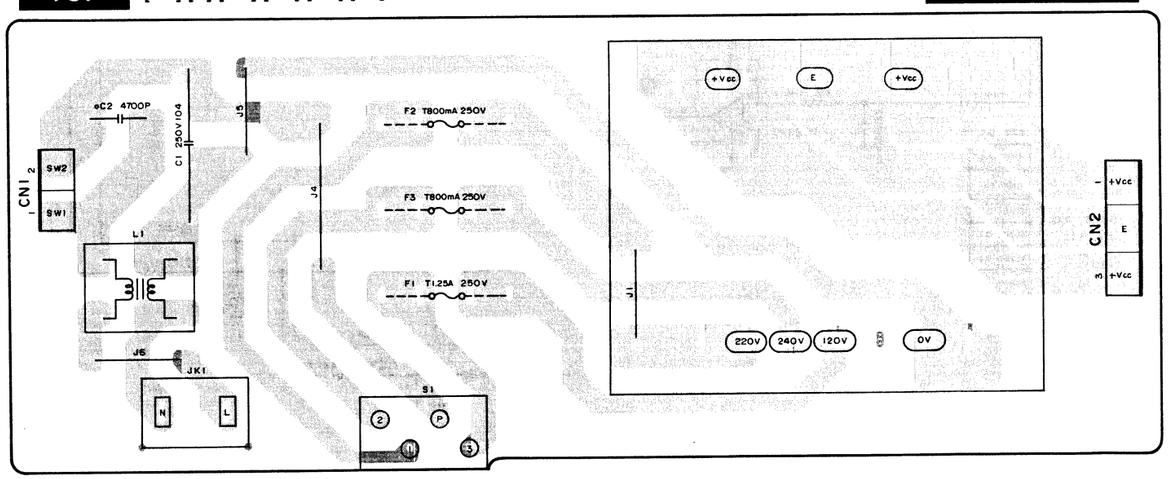
TCF Other areas — SXPG2



TCF

NOTE:
- FUSE
  F3: XBA2C08TB0

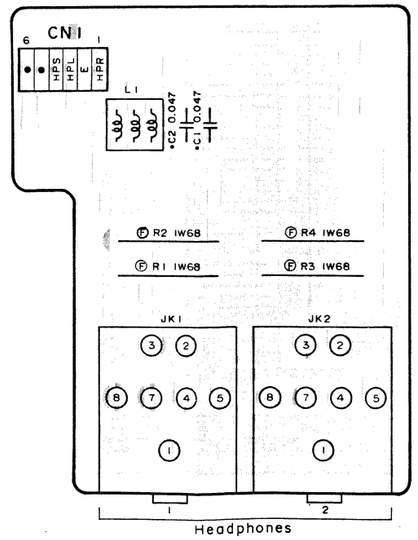
TCF [EK] [X] [XR] [XS] [XD] [XT] areas — SXPG211041



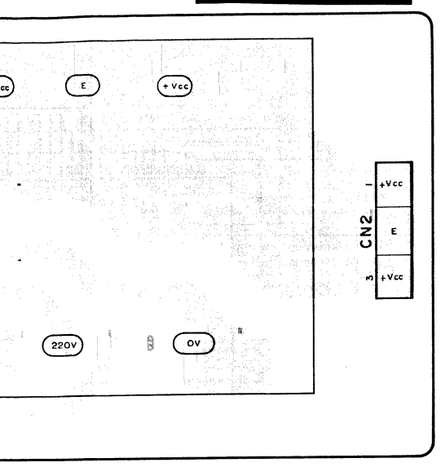
TCF

NOTES:
- FUSES
  F1: XBA2C12TB0
  F2, 3: XBA2C08TB0

HP — SXPG21082



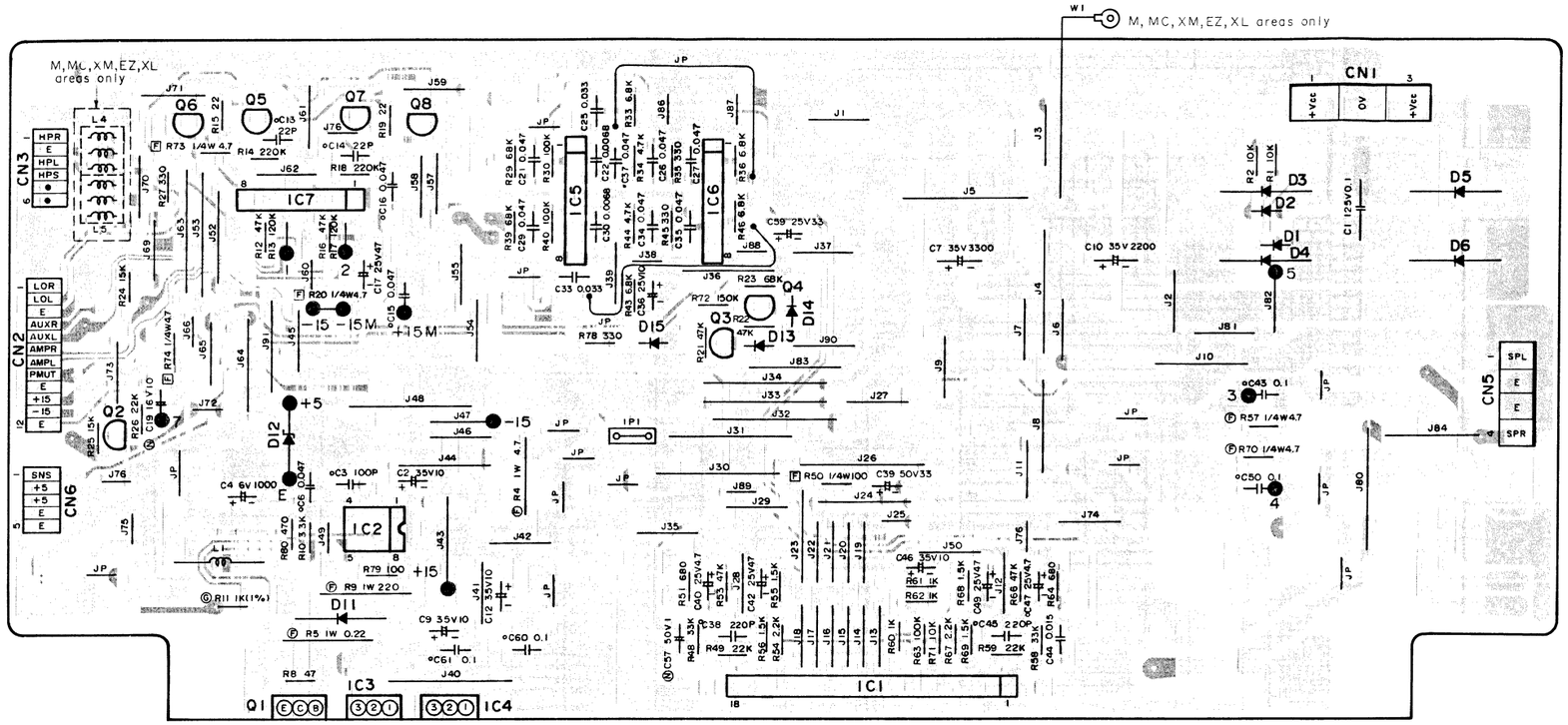
SXPG211011



AS

• [EZ] [XL] areas **SXPG210231**

• Others **SXPG210291**



AS

NOTES:

• IC'S

IC1:	SVIGS4132M2M
IC2:	SVIGM5291P
IC3:	SVIGM5F7815
IC4:	SVIGM5F7915
IC5~7:	SVIGM5218L

• TRANSISTORS

Q1:	2SA1643
Q2, 3:	2SA1015-GR
Q4:	2SC2320LFG
Q5, 7:	2SC3940ARS
Q6, 8:	2SA1534ARS

• DIODES

D1, 2:	ERA1502V5
D3~6:	SVDS3V20
D11:	SVDGRK14S
D12:	MA2062LF
D13:	EK04
D14, 15:	MA165TA5

• IC Protector

IP1:	ICP-N25T104

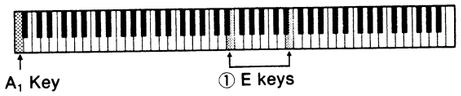
TRANSFORMER & FUSE, AMP & POWER SUPPLY AND HEADPHONES CIRCUIT DIAGRAM

■ Measuring Conditions

Check Point ❶~❹

Set to the self-diagnostic mode followings.

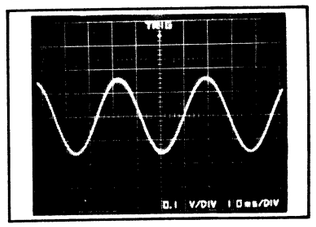
- While pressing two E keys (①) simultaneously, turn on the power switch.
- SOUND..... GRAND PIANO
- Main Volume..... Max
- Keyboard ..... A_1 (②)



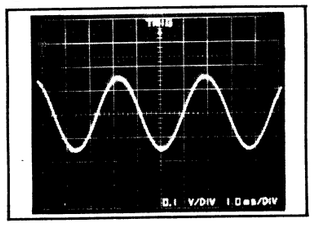
Check Point ❺, ❼

Set the initial setting mode (Refer to page I −6)

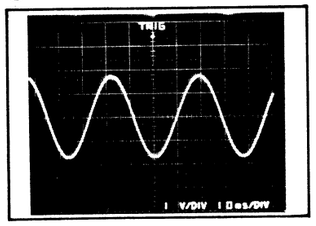
❶



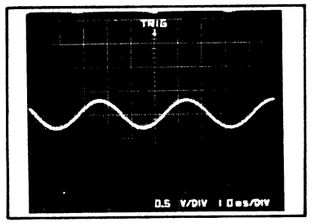
❷



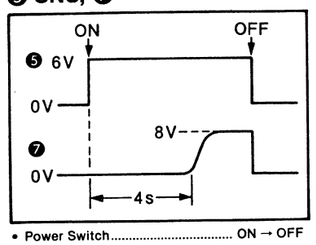
❸



❹

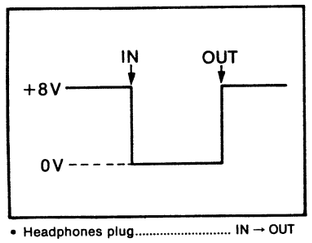


❺ SNS, ❼

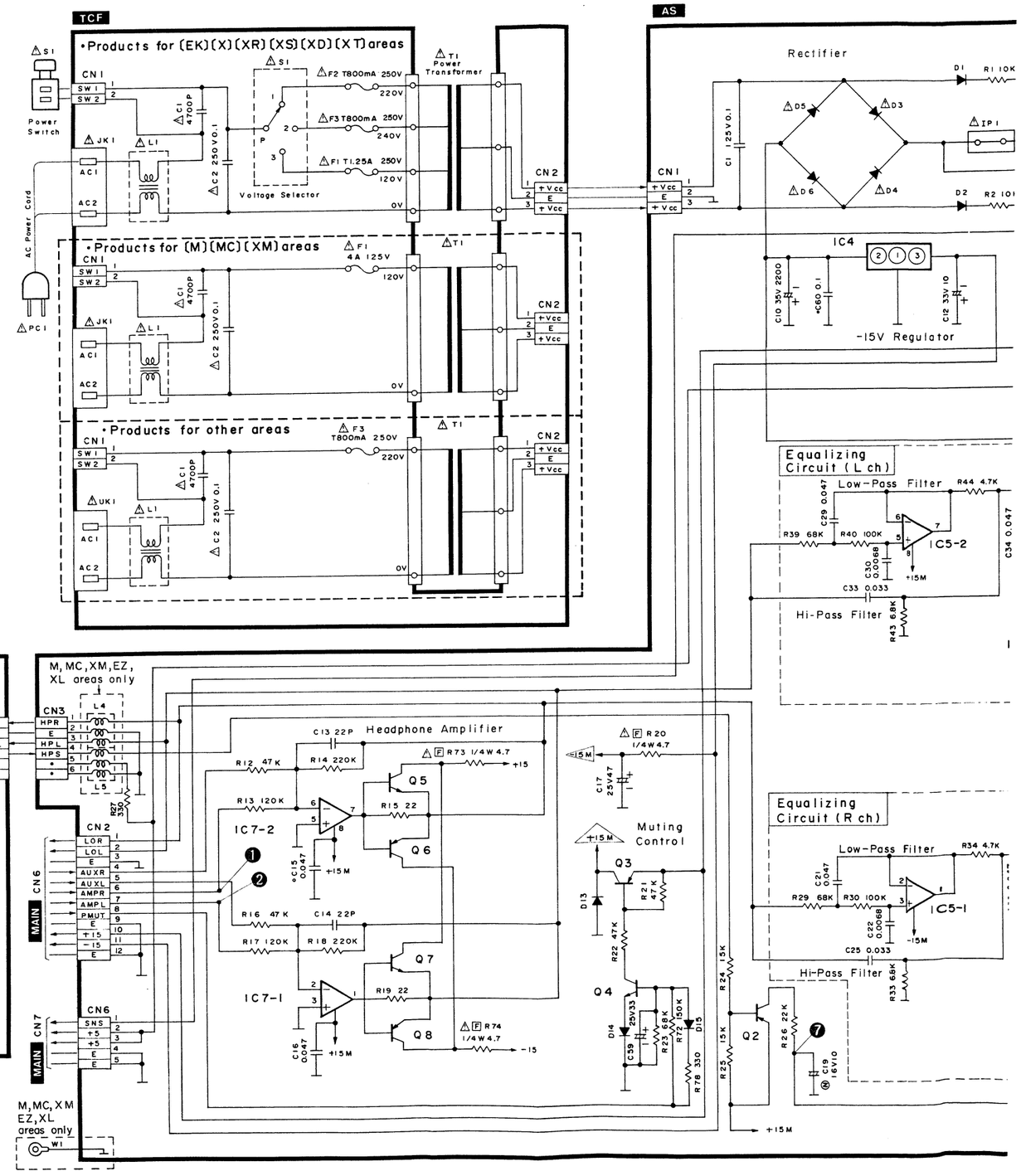


- Power Switch..... ON → OFF

❼



- Headphones plug..... IN → OUT



MP & POWER SUPPLY AND HEADPHONES CIRCUIT DIAGRAM

5 6 7 8 9 10 11 12 13 14

TCF

•Products for (EK)(X)(XR)(XS)(XD)(XT)areas

•Products for (M)(MC)(XM)areas

•Products for other areas

AS

Rectifier

Equalizing Circuit (L ch)

Equalizing Circuit (R ch)

Low-Pass Filter

Hi-Pass Filter

Notch Filter

Power Amplifier (L ch)

Power Amplifier (Rch)

+5V Switching Regulator

-15V Regulator

+15V Regulator

Headphone Amplifier

Muting Control

Voltage Selector

M,MC,XM,EZ, XL areas only

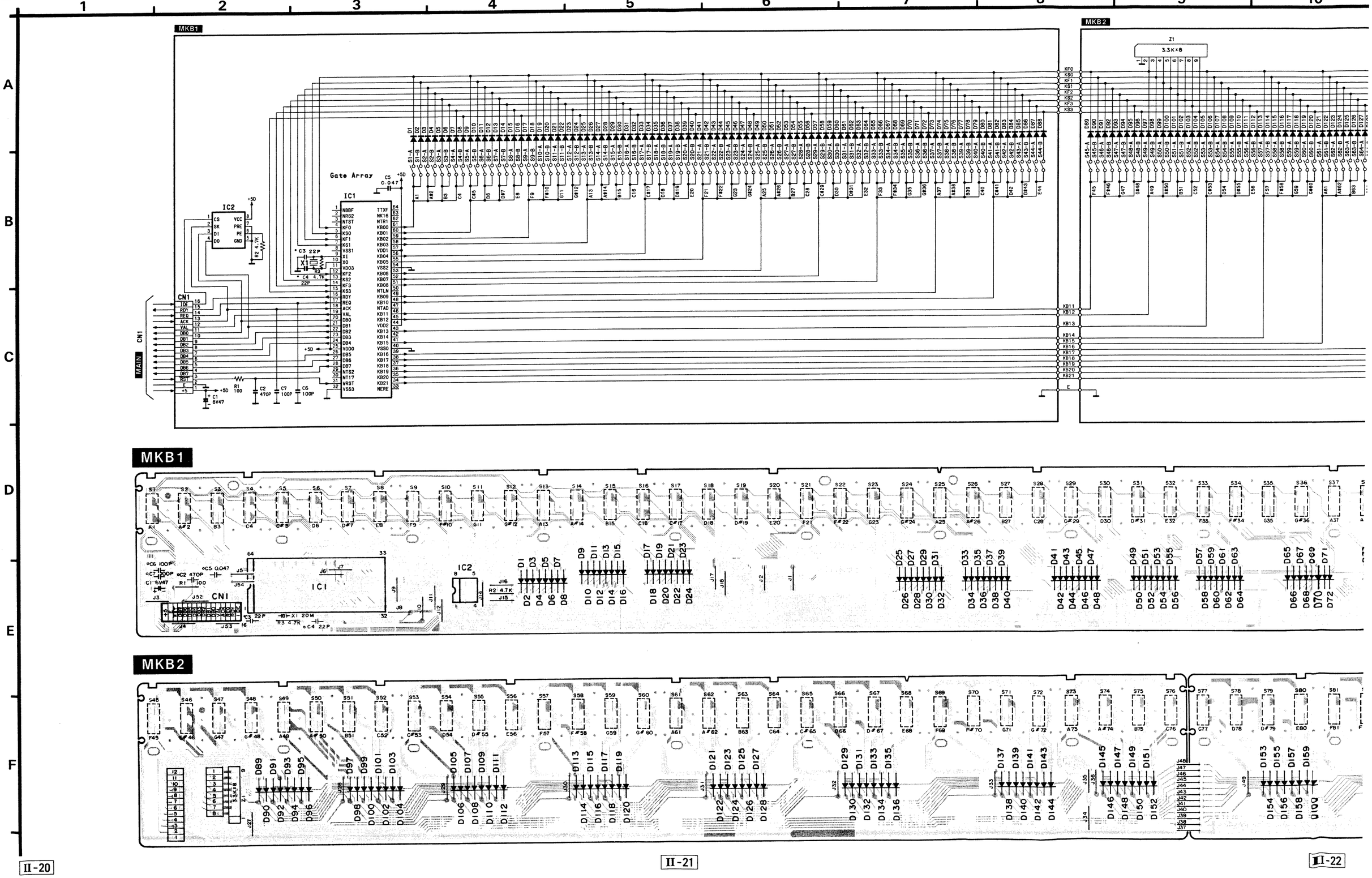
M,MC,XM EZ,XL areas only

SP1 16cm, 8Ω

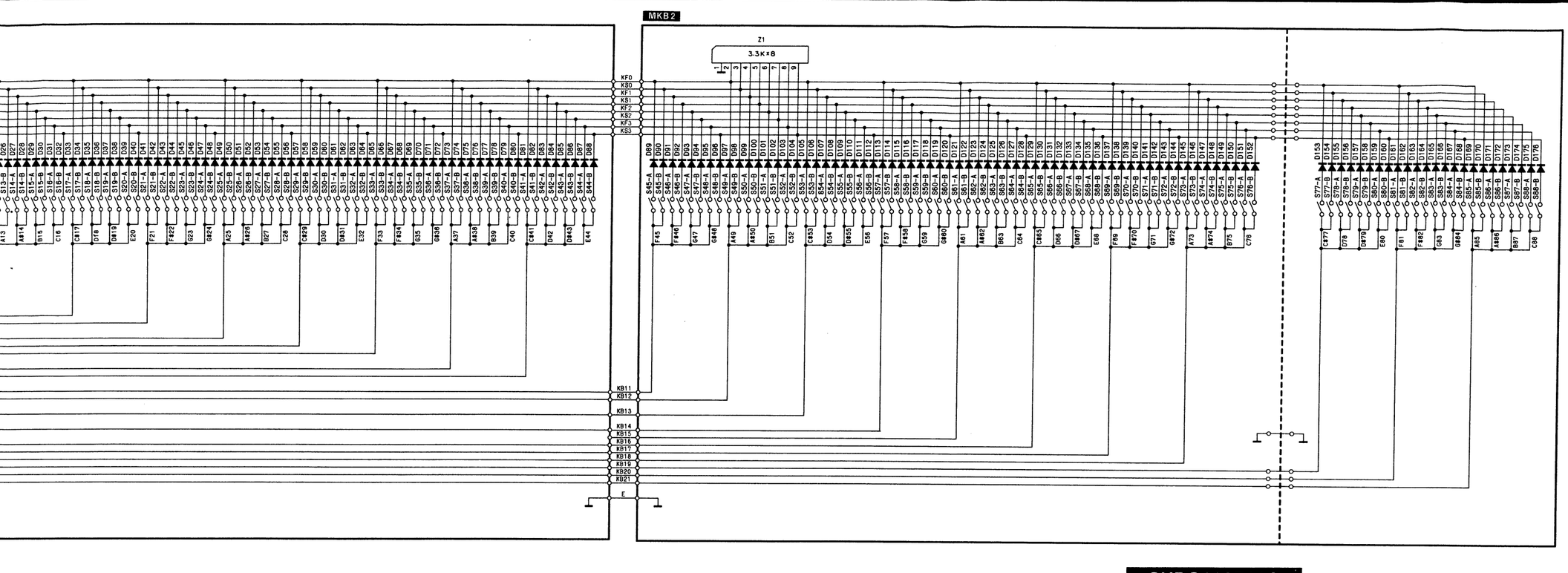
SP2 12cm, 8Ω

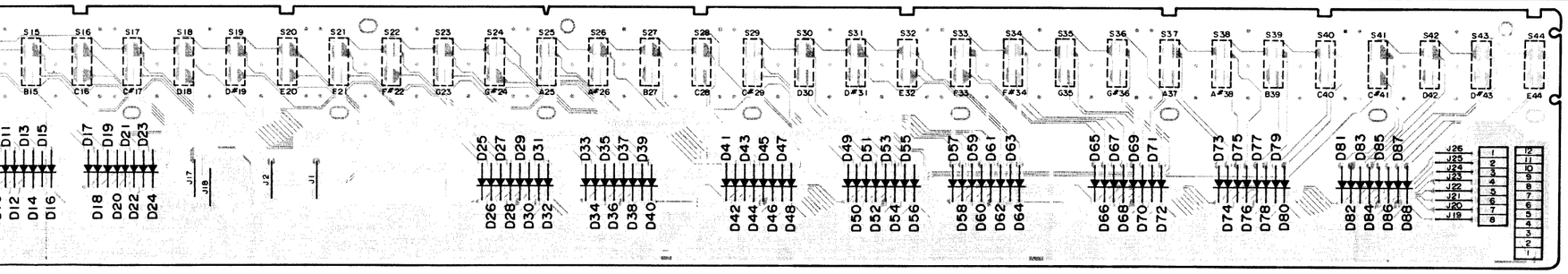
II-17 II-18 II-19

MKB1 MKB2 MANUAL KEYBOARD 1 AND 2 CIRCUIT

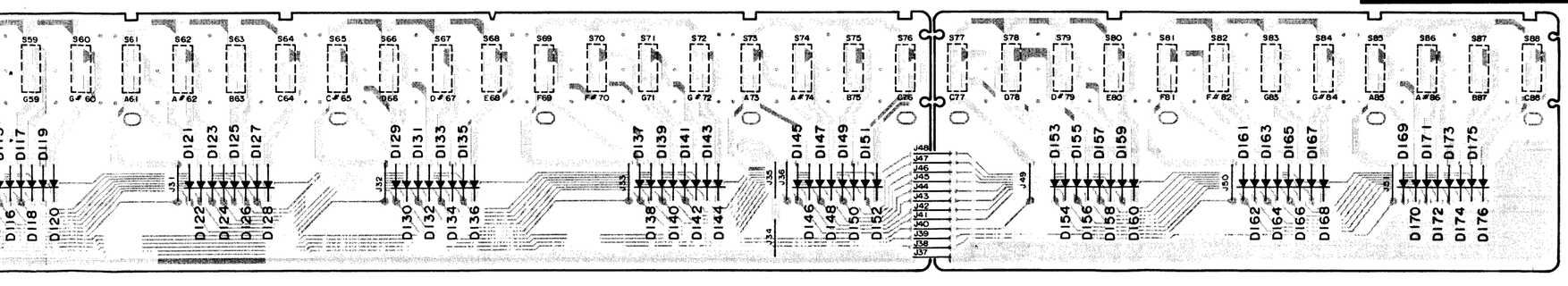


CIRCUIT





SXPG209711B



MKB1

NOTES:

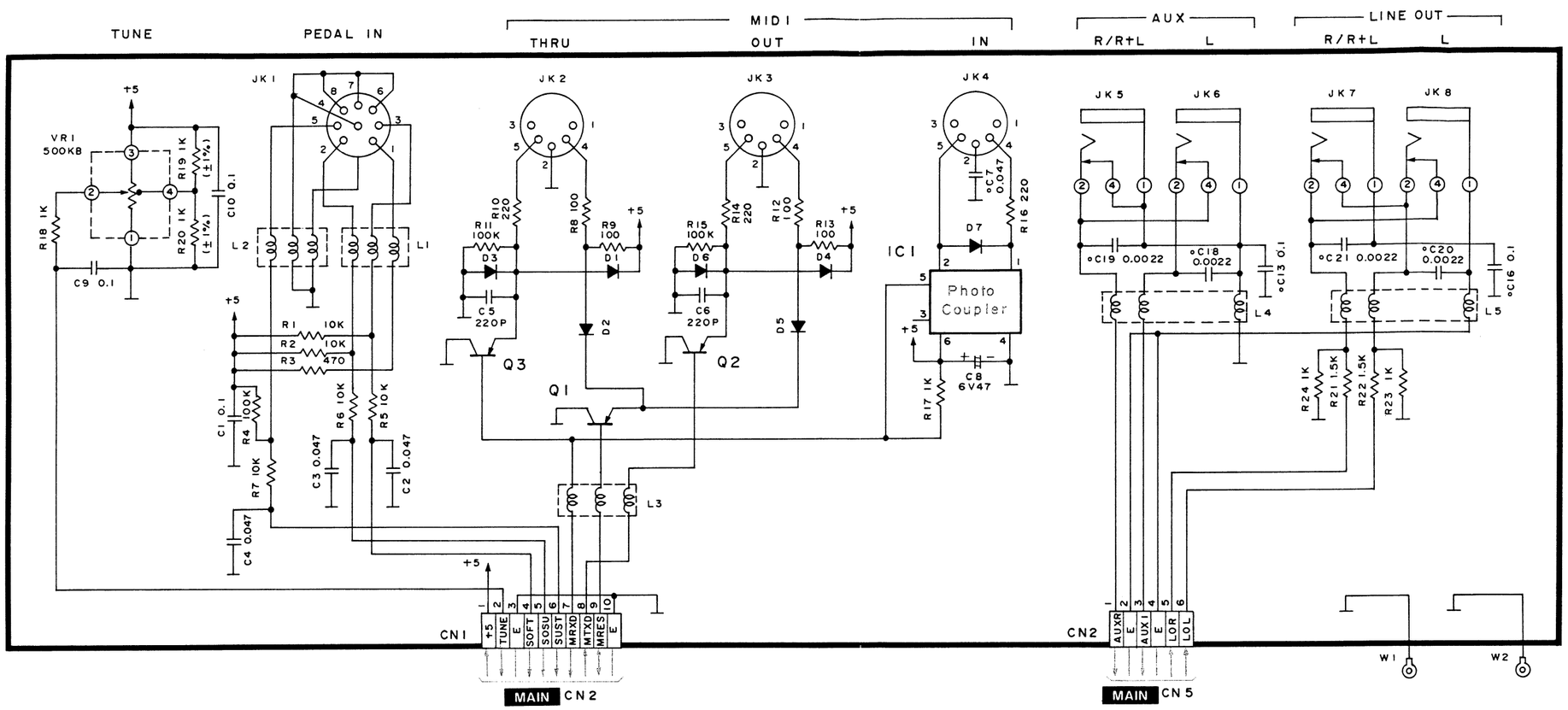
- IC'S
  - IC1: MSM7U042016
  - IC2: BR93CS46
- DIODES
  - D1~88: MA162A

MKB2

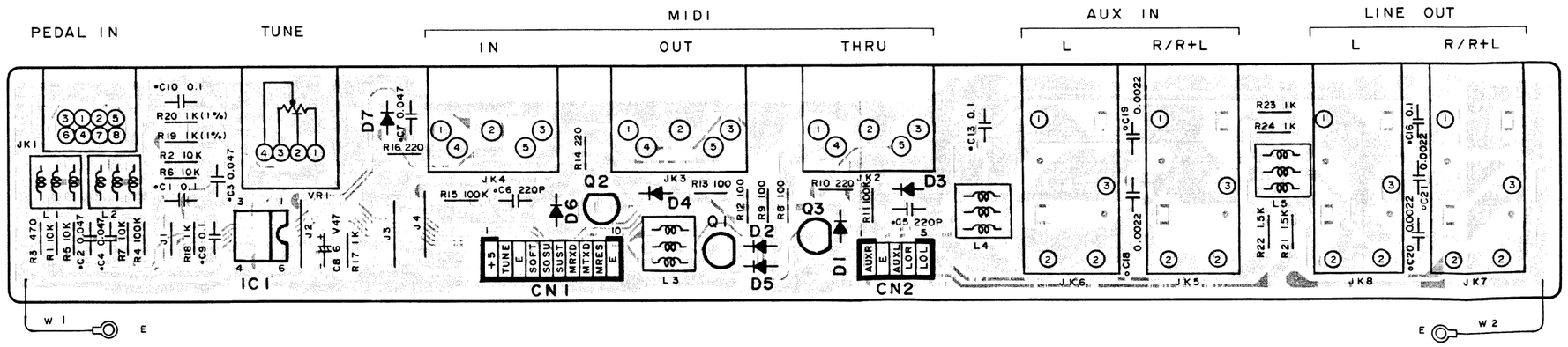
NOTES:

- DIODES
  - D1~88: MA162A

JACK CIRCUIT



SXPG209821

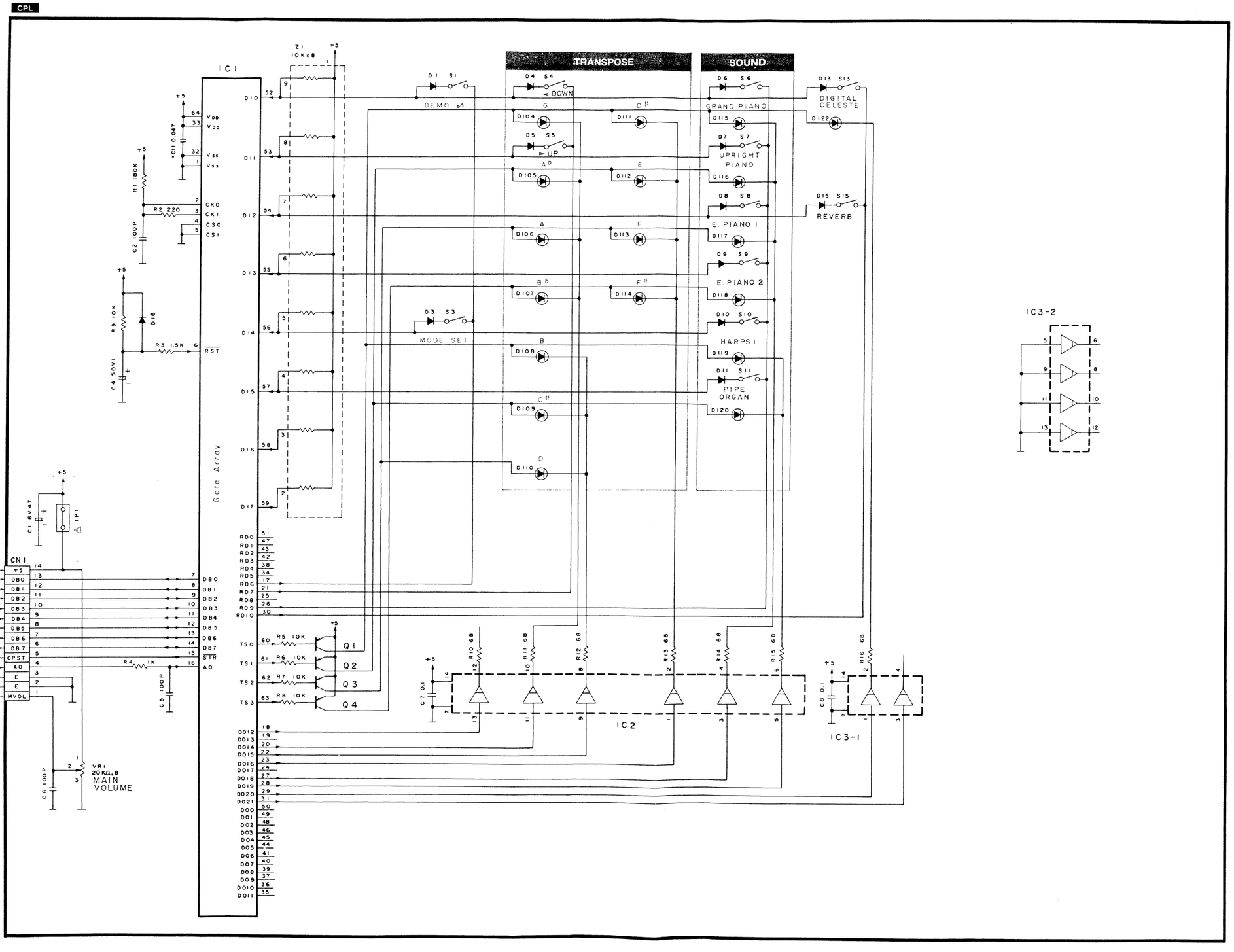


JACK

NOTES:

- IC
  IC1: SVIGTLP513
- TRANSISTORS
  Q1~3: 2SA1015-GR
- DIODES
  D1~7: MA165TA5

CPL CONTROL PANEL CIRCUIT DIAGRAM



TCF TCF CIRCUIT

	Ref. No.		Part No.	Description	Per/Set
		COILS & LINE FILTERS			
	L1	⚠	SLTGLF3	Line Filter	1
		JACKS			
	JK1	⚠	SJVD0203B	AC Inlet	1
		SWITCHES			
	S1	EK X ⚠ XR XS XD XT	SSRG100A	Voltage Selector	1
		FUSES			
	F1	M MC ⚠ XM	XBA1C40NU100	4A, 125V	1
	F1	EK X ⚠ XR XS XD XT	XBA2C12TB0	T1.25A, 250V	1
○	F2, 3	⚠	XBA2C08TB0	T800mA, 250V	2
○	F3	Others ⚠	XBA2C08TB0	T800mA, 250V	1
		CAPACITORS			
	C1	⚠	ECKCVA1472MF	4700pF, Line-Capacitor	1
	C2	⚠	ECQU2A104MN	0.1μF, 250V, Across-the Line Capacitor	1

AS AMP & POWER SUPPLY CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGS4132M2M	Power Amplifier	1
	IC2	SVIGM5291P	Switching Regulator	1
	IC3	SVIGM5F7815	+15V Voltage Regulator	1
	IC4	SVIGM5F7915	−15V Voltage Regulator	1
S	IC5~7	SVIGM5218L	Operational Amplifier	3
	TRANSISTORS			
	Q1	2SA1643	Transistor	1
S	Q2, 3	2SA1015-GR	2SA933STRS (SUB. Part)	2
S	Q4	2SC2320LFG	2SC1310FG (SUB. Part)	1
	Q5, 7	2SC3940ARS	Transistor	2
	Q6, 8	2SA1534ARS	Transistor	2
	DIODES			
	D1, 2	ERA1502V5	Diode	2
S	D3~6 ⚠	SVDS3V20	Rectifier	4
	D11	SVDGRK14S	Diode	1
	D12	MA2062LF	Zener, 6.2V	1
	D13	EK04	Diode	1
	D14, 15	MA165TA5	Diode	2
	COILS & LINE FILTERS			
	L1	QLQGT1T121SA	Coil	1
	L4, 5	QLQGT3T150SA	Coil	2
	CONNECTOR			
○	CN2	QJTG01012AA	Connector	1
○	CN6	QJTG01005AA	Connector	1
	IC PROTECTOR			
○	IP1 ⚠	ICP-N25T104	IC Protector	1
	WIRES			
	W1	SWEG690A	Wire	1
	RESISTORS			
	R1, 2	ERDS2TJ103	10kΩ	2
	R4 ⚠	ERX1ANJP4R7S	4.7Ω, 1W, Flame-Proof	1
	R5 ⚠	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	1
	R8	ERDS2TJ470	47Ω	1
	R9 ⚠	ERG1ANJP221S	220Ω, 1W, Flame-Proof	1
	R10	ERDS2TJ332	3.3kΩ	1
	R11	ER0S2TKF1001	1kΩ, ±1%	1
	R12	ERDS2TJ473	47kΩ	1
	R13	ERDS2TJ124	120kΩ	1
	R14	ERDS2TJ224	220kΩ	1
	R15	ERDS2TJ220	22Ω	1
	R16	ERDS2TJ473	47kΩ	1
	R17	ERDS2TJ124	120kΩ	1
	R18	ERDS2TJ224	220kΩ	1
	R19	ERDS2TJ220	22Ω	1
	R20 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
	R21, 22	ERDS2TJ473	47kΩ	2
	R23	ERDS2TJ683	68kΩ	1
	R24, 25	ERDS2TJ153	15kΩ	2
	R26	ERDS2TJ223	22kΩ	1
	R27	ERDS2TJ331	330Ω	1
	R29	ERDS2TJ683	68kΩ	1
	R30	ERDS2TJ104	100kΩ	1
	R33	ERDS2TJ682	6.8kΩ	1
	R34	ERDS2TJ472	4.7kΩ	1
	R35	ERDS2TJ331	330Ω	1
	R36	ERDS2TJ682	6.8kΩ	1
	R39	ERDS2TJ683	68kΩ	1
	R40	ERDS2TJ104	100kΩ	1
	R41	ERDS2TJ472	4.7kΩ	1
	R43	ERDS2TJ682	6.8kΩ	1
	R44	ERDS2TJ472	4.7kΩ	1
	R45	ERDS2TJ331	330Ω	1
	R46	ERDS2TJ682	6.8kΩ	1
	R47	ERDS2TJ222	2.2kΩ	1
	R48	ERDS2TJ333	33kΩ	1
	R49	ERDS2TJ223	22kΩ	1
	R50 ⚠	ERD2FCVG101	100Ω, 1/4W, Fuse Type	1

Ref. No.	Part No.	Description	Per/Set
R51	ERDS2TJ681	680Ω	1
R53	ERDS2TJ473	47kΩ	1
R54	ERDS2TJ222	2.2kΩ	1
R55, 56	ERDS2TJ152	1.5kΩ	2
R57 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
R58	ERDS2TJ333	33kΩ	1
R59	ERDS2TJ223	22kΩ	1
R60~62	ERDS2TJ102	1kΩ	3
R63	ERDS2TJ104	100kΩ	1
R64	ERDS2TJ681	680Ω	1
R66	ERDS2TJ473	47kΩ	1
R67	ERDS2TJ222	2.2kΩ	1
R68, 69	ERDS2TJ152	1.5kΩ	2
R70 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
R71	ERDS2TJ103	10kΩ	1
R72	ERDS2TJ154	150kΩ	1
R73, 74 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2
R78	ERDS2TJ331	330Ω	1
R79	ERDS2TJ101	100Ω	1
R80	ERDS2TJ471	470Ω	1
CAPACITORS			
C1 ⚠	ECQE1A104M6	0.1μF, 125V	1
C2	ECEA1VKG100	10μF, 35V	1
C3	ECCR1H101J	100pF	1
C4	ECEA0JU102	1000μF, 6.3V	1
C6	ECKR1E473ZV	0.047μF	1
C7	ECEA1VU332	3300μF, 35V	1
C9	ECEA1VKG100	10μF, 35V	1
C10	ECEA1VU222	2200μF, 35V	1
C12	ECEA1VKG100	10μF, 35V	1
C13, 14	ECCR1H220J	22pF	2
C15, 16	ECKR1E473ZV	0.047μF	2
C17	ECEA1EKA470	47μF, 25V	1
C19	ECEA1CKN100	10μF, 16V	1
○ C20	ECQB1H103JF	0.01μF	1
○ C21	ECQB1H473JF	0.047μF	1
C22	ECQG1H682KZ	0.0068μF	1
○ C25	ECQB1H333JF	0.033μF	1
○ C26, 27	ECQB1H473JF	0.047μF	2
C29	ECQG1H682KZ	0.0068μF	1
C30	ECQG1H682KZ	0.0068μF	1
○ C33	ECQB1H333JF	0.033μF	1
○ C34, 35	ECQB1H473JF	0.047μF	2
C36	ECEA1EKA100	10μF, 25V	1
C37	ECKR1E473ZV	0.047μF	1
C38	ECCR1H221J	220pF	1
C39	ECEA1HU330	33μF, 50V	1
C40	ECEA1EKA4R7	4.7μF, 25V	1
C42	ECEA1EKA470	47μF, 25V	1
C43	ECRR1H104ZF	0.1μF	1
○ C44	ECQB1H153JF	0.015μF	1
C45	ECCR1H221J	220pF	1
C46	ECEA1VKG100	10μF, 35V	1
C47	ECEA1EKA4R7	4.7μF, 25V	1
C49	ECEA1EKA470	47μF, 25V	1
C50	ECRR1H104ZF	0.1μF	1
C57	ECEA1HKN010	1μF, 50V	1
C59	ECEA1EKA330	33μF, 25V	1
C60, 61	ECRR1H104ZF	0.1μF	2

HP HEADPHONES CIRCUIT

Ref. No.	Part No.	Description	Per/Set
COILS & LINE FILTERS			
L1	QLQGT3T150SA	Coil	1
JACKS			
JK1, 2	SJJG100A	Headphone Jack	2
RESISTORS			
R1~4 ⚠	ERG1ANJP680S	68Ω, 1W, Flame-Proof	4
CAPACITORS			
C1, 2	ECKR1E473ZV	0.047μF	2

CPL CONTROL PANEL CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2, 3	SVIGM74LS07	Hex Buffers (O.C.)	2
TRANSISTORS			
Q1~4	2SA830SB	Transistor	4
DIODES			
D1~11, 13, 15, 16	MA165TA5	Diode	14
D101~120, 122, 124	LN282R	LED (Red)	22
COMPONENT COMBINATIONS			
Z1	EXBPI8103JM	10kΩ×8	1
SWITCHES			
○ S1, 3~11, 13, S15	QSPG1005AA	Push Switch	12
IC PROTECTOR			
IP1 ⚠	ICP-N10T104	IC Protector	1
VARIABLE RESISTORS			
VR1	EVD06510B24G	20kΩ B, MAIN Volume	1

Ref. No.	Part No.	Description	Per/Set
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2	ERDS2TJ221	220Ω	1
R3	ERDS2TJ152	1.5kΩ	1
R4	ERDS2TJ102	1kΩ	1
R5~9	ERDS2TJ103	10kΩ	5
R10~16	ERDS2TJ680	68Ω	7
CAPACITORS			
C1	ECEA0JKA470	47μF, 6.3V	1
C2	ECCR1H101J	100pF	1
C4	ECEA1HKA010	1μF, 50V	1
C5, 6	ECCR1H101J	100pF	2
C7, 8	ECRR1H104ZF	0.1μF	2
C9, 10	ECRR1H104ZF	0.1μF	2
C11	ECKR1E473ZV	0.047μF	1

MKB1 MANUAL KEYBOARD 1 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
○ IC1	MSM7U042016	Gate Array	1
○ IC2	BR93CS46	1k bit Programmed EEPROM	1
DIODES			
S D1~88	MA162A	MA150IR (SUB. Part)	88
OSCILLATOR			
X1	SVQGA20MX040	20MHz, Ceramic Oscillator	1
RESISTORS			
R1	ERDS2TJ101	100Ω	1
R2, 3	ERDS2TJ472	4.7kΩ	2
CAPACITORS			
C1	ECEA0JU470	47μF, 6.3V	1
C2	ECCW1H471J5	470pF	1
C3, 4	ECCW1H220J5	22pF	2
C5	ECKR1E473ZV	0.047μF	1
C6, 7	ECCW1H101J5	100pF	2

MKB2 MANUAL KEYBOARD 2 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
S D1~88	MA162A	MA150IR (SUB. Part)	88
COMPONENT COMBINATION			
Z1	EXBP88332JM	3.3kΩ×8	1

JACK JACK CIRCUIT

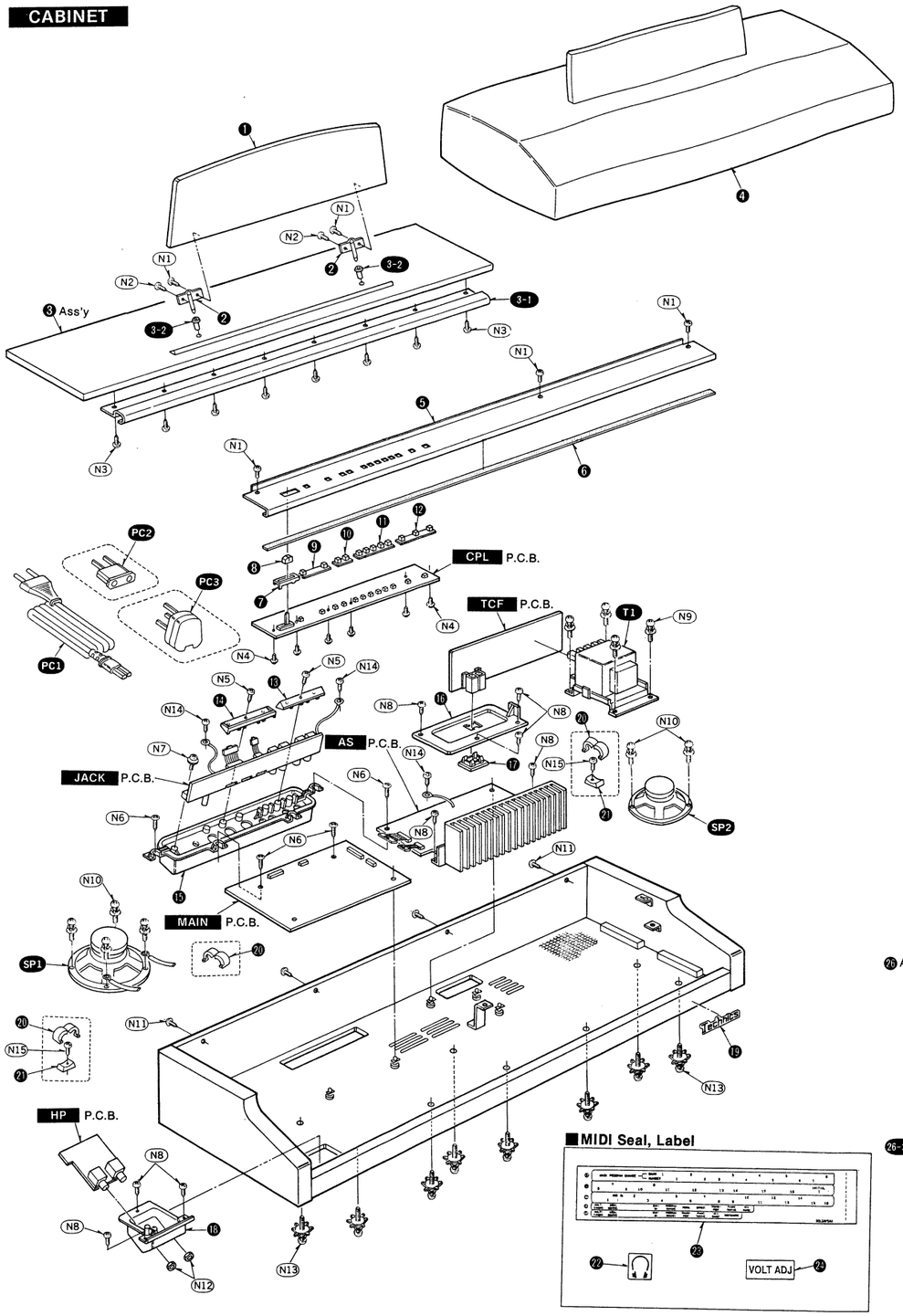
Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGTLP513	Photo Coupler	1
TRANSISTORS			
S Q1~3	2SA1015-GR	2SA933STRS (SUB. Part)	3
DIODES			
D1~7	MA165TA5	Diode	7
COILS			
L1~5	QLQGT3T150SA	Coil	5
JACKS			
JK1	QJSG002AA	PEDAL IN	1
JK2~4	SJSG1370A	MIDI (IN, OUT, THRU)	3
JK5~8	QJJG003AA	LINE IN, AUX OUT	4
CONNECTORS			
○ CN1	QJTG01010AA	Connector	1
○ CN2	QJTG01005AA	Connector	1
VARIABLE RESISTORS			
VR1	EVJ01PF25B55	500kΩ B, TUNE	1
WIRES			
W1	QEXG01001RA	Wire	1
W2	SWEG630A	Wire	1

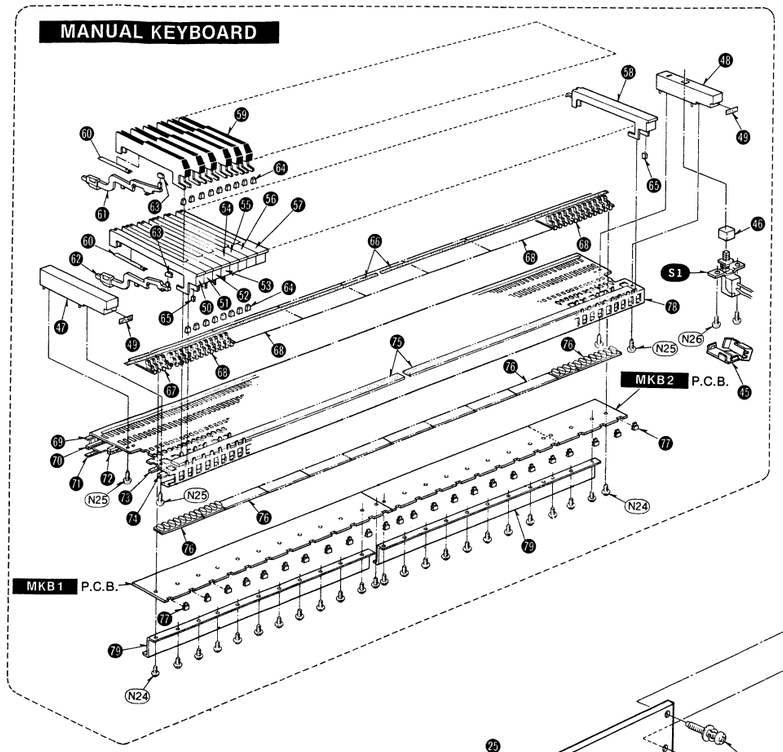
Ref. No.	Part No.	Description	Per/Set
RESISTORS			
R1, 2	ERDS2TJ103	10kΩ	2
R3	ERDS2TJ471	470Ω	1
R4	ERDS2TJ104	100kΩ	1
R5~8	ERDS2TJ103	10kΩ	4
R8, 9	ERDS2TJ101	100Ω	2
R10	ERDS2TJ221	220Ω	1
R11	ERDS2TJ104	100kΩ	1
R12, 13	ERDS2TJ101	100Ω	2
R14	ERDS2TJ221	220Ω	1
R15	ERDS2TJ104	100kΩ	1
R16	ERDS2TJ221	220Ω	1
R17~18	ERDS2TJ102	1kΩ	2
R19, 20	ER0S2TKF1001	1kΩ, ±1%	2
R21, 22	ERDS2TJ152	1.5kΩ	2
R23, 24	ERDS2TJ102	1kΩ	2
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2~4	ECKR1E473ZV	0.047μF	3
C5, 6	ECCR1H221J	220pF	2
C7	ECKR1E473ZV	0.047μF	1
C8	ECEA0JKA470	47μF, 6.3V	1
C9, 10	ECRR1H104ZF	0.1μF	2
C13	ECRR1H104ZF	0.1μF	1
C16	ECRR1H104ZF	0.1μF	1
C18~21	ECBA1H222KB	0.0022μF	4

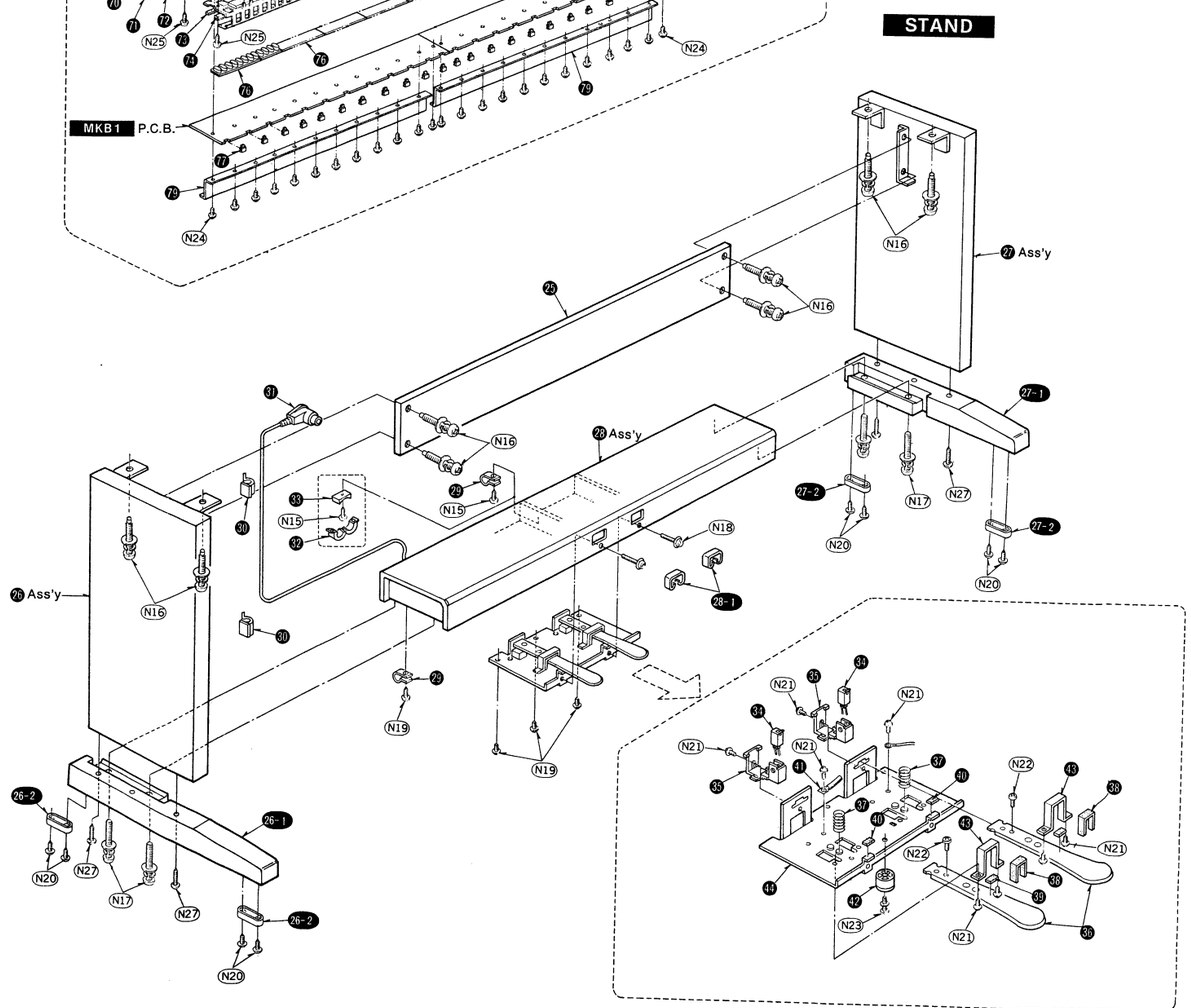
■ WIRING PARTS

Ref. No.	Part No.	Description	Per/Set
○ W1	QEXGSS06090A	Connector with Wire	1
○ W2	QEXGSS16045A	Connector with Wire	1
○ W3	QEXGSS14015A	Connector with Wire	1
○ W4	QEXGVH05050B	Connector with Wire	1
○ W5	QEXGVH03105B	Connector with Wire	1
○ W6	QEXGVH04085B	Connector with Wire	1

CABINET PARTS LOCATION







REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

1. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. ○ mark are new parts.
3. For part No. with area mark, check the area when placing an order.
4. Keyboard chassis part No. with mark (NLA) is no longer available after production discontinuation of the complete set.

■ CABINET & CHASSIS PARTS

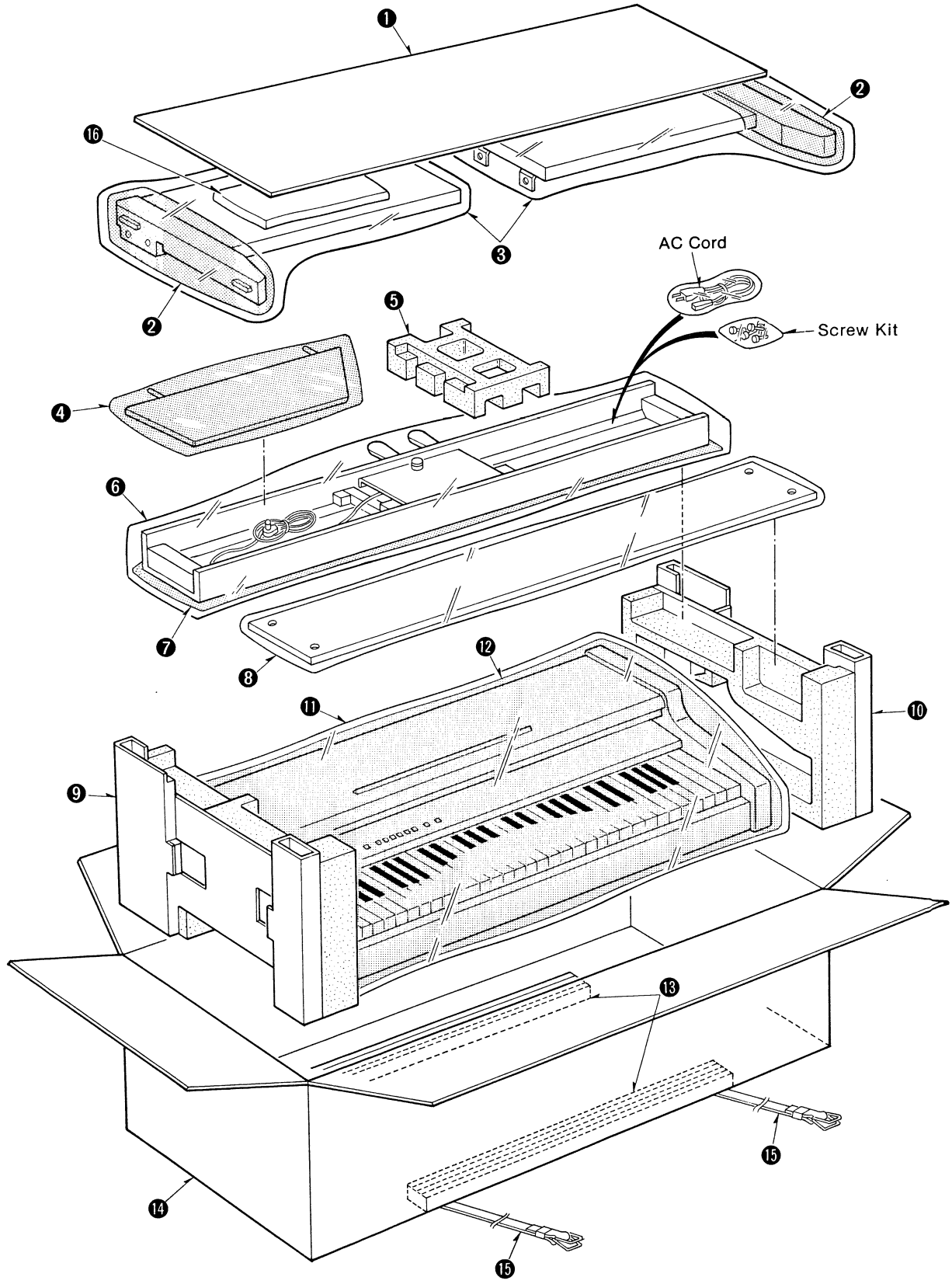
	Ref. No.	Part No.	Description	Per/Set
	SWITCH			
	S1 ⚠	ESB823V	Power Switch	1
	SPEAKERS			
	SP1	QASG16PL01A	16cm, 8Ω	1
	SP2	QASG12PL01A	12cm, 8Ω	1
	TRANSFORMERS			
○	T1 M MC XM ⚠	QTPG1M015A	Power Transformer	1
○	T1 EK X XR XS XT XD ⚠	QTPG1M018A	Power Transformer	1
○	T1 Others ⚠	QTPG1M017A	Power Transformer	1
	POWER CORD & PLUG			
	PC1 XL XR ⚠	SJAG61	AC Power Cord	1
	PC1 M MC XM ⚠	SJAG62	AC Power Cord	1
	PC1 EK XS XD ⚠	QJAG001AA	AC Power Cord	1
	PC1 Others ⚠	SJAG65	AC Power Cord	1
	PC2 X ⚠	SJP5213-1	Attachment Plug	1
	PC3 XD ⚠	SJPG1350A	Power Plug	1
	CABINET PARTS			
○	1	QGAG1015AA	Music Rack	1
	2	SBLG230A	Stay	2
○	3	QKQGA048AA	Top Cover Ass'y	1
○	3-1	QGKG0084AA	Ornament	1
○	3-2	QMRG7021AB	Sleeve	2
	4	QFCG003AA	Dust Cover	1
○	5	QGPG0040DA	Control Panel	1
	6	QMFG1035AA	Felt (Red)	1
	7	SGEG260A	Ornament for Sliding Volume	1
	8	SBNG7050A	Knob	1
○	9	QGUG1138BA	Button	1
○	10	QGUG1139AA	Button	1
○	11	QGUG1140AA	Button	1
○	12	QGUG1140CA	Button	1
○	13	QMRG7028AB	Bracket	1
○	14	QMRG7029AB	Bracket	1
○	15	QGKG0076AB	External Jack Case	1
○	16 EK X XR XS XT XD	QGKG0079CA	AC Jack Panel	1
○	16 Others	QGKG0079DA	AC Jack Panel	1
	17 XL XR ⚠	SJS9334A	AC Inlet Cover	1
	17 Others ⚠	SJS9231A	AC Inlet Cover	1
○	18	QGKG0080AA	Headphone Jack Case	1
	19	SGBG160B	Badge	1
○	20 EZ M MC XM XL	QLZG003A	Core	3
	21 EZ M MC XM XL	SHRG1270A	Mounting Base	2
	22	SGKG3040B	Label (Headphone)	1
○	23	QQLG045AA	MIDI Seal	1
○	24 EK X XR XS XD XT	QQLG044AA	Label (VOLT ADJ)	1
	STAND			
	25	QKQGD020AA	Crossboard	1
○	26	QKQGB188AA	Left Plank Ass'y	1
○	26-1	QKSGB006AA	Leg, Left	1
	26-2	SHRG2130B	Foot	2
○	27	QKQGB189AA	Right Plank Ass'y	1
○	27-1	QKSGB007AA	Leg, Right	1
	27-2	SHRG2130B	Foot	2
○	28	QKQGM032AAK	Pedal Box Ass'y	1
	28-1	QGKG0036AAK	Ornament	2
	29	SHRG1230A	Cord Clamper	2
	30	SHRG9620A	Cord Clamper	3
	31	QJLG002AB	Pedal Cord	1
○	32 EZ M MC XM XL	QLZG003A	Core	1
	33 EZ M MC XM XL	SHRG1270A	Mounting Base	1
	34	SRDSMLS-2	Switch	2
	35	QMWG8005AB	Switch Cover	2
	36	STBG3120A	Pedal	2
	37	SUSG441A	Spring	2
	38	SHSG2750A	Felt	2
	39	SHSG2770A	Felt	2
	40	SHSG2790A	Felt	2
	41	SUWG219	Binder	1
	42	SKLG160A	Foot	1
	43	STBG4090A	Arm Guide	2
	44	STBG6174A	Chassis	1
	MANUAL KEYBOARD			
	45	SHRG8390A	Cover, Power SW.	1
	46	QGUG1040AA	Button, Power Switch	1
○	47	QGPG0042AB	End Cover Panel, Left	1
○	48	QGPG0041AB	End Cover Panel, Right	1
	49	SHSG3690A	Felt	2
	50	STBGA1050A	White Key (First Octave A Key)	1
	51	STBGA1060A	White Key (B Key)	8
	52	STBGA1070A	White Key (C Key)	7
	53	STBGA1080A	White Key (D Key)	7
	54	STBGA1090A	White Key (E Key)	7
	55	STBGA1100A	White Key (F Key)	7
	56	STBGA1110A	White Key (G Key)	7
	57	STBGA1120A	White Key (A Key)	7
	58	STBGA1130A	White Key (Top Octave C Key)	1
	59	STBG2920A	Black Key	36

Ref. No.		Part No.	Description	Per/Set
○ 60		SUSG533A	Spring	88
○ 61		QMWG8014AA	Hammer (Black Key)	36
○ 62		QMWG8013AA	Hammer (White Key)	52
63		SHGG9121A	Rubber Cap (Hammer)	88
64		SHRG9900B	Key Guide Rubber	88
65		SHSG5910A	Felt	52
○ 66		QMFG4067AA	Felt	2
67		QMWG8004BA	Fulcrum (4 pcs. on one)	1
68		QMWG8003BA	Fulcrum (12 pcs. on one)	7
69		SHRGA9080A	Sponge	2
○ 70		QMFG1073AA	Felt	2
71		SHSG3461A	Felt	1
○ 72		QMFG1074CA	Felt	2
73		QMFG1061AA	Felt	2
74		QMFG1060AA	Felt	2
75		SHSG3451A	Felt	2
○ 76		QMWG6006AA	Rubber Switch (8 pcs. on one)	11
77		SHRG9751A	P.C.B. Holder	24
○ 78	(NLA)	STBG6216A	Chassis	1
79		SUWG3152A	Angle	2
SCREWS & WASHERS				
N1		XTT4+10AFZ	Screw	5
N2		XTB3+10AFZ	Screw	2
N3		XTT4+10A	Screw	8
N4		XTV3+8J	Screw	6
N5		XTW3+10Q	Screw	2
N6		XTT4+20A	Screw	4
N7		XTWSG2	Screw with Washer	1
N8		XTB35+12A	Screw	8
N9		XYN4+F16	Screw with Washer	4
N10		XYN4+F25	Screw with Washer	6
N11		XTT4+30AFZ	Screw	4
N12		XNS12FZ	Nut	2
○ N13		QHDG019AA	Screw with Washer	8
N14		SNEG2660A	Screw	3
N15		XTB3+12A	Screw	3
○ N16		QHDG016AB	Screw with Washer	8
○ N17		XYN6+F40	Screw with Washer	4
N18		XYN4+F16FZ	Screw with Washer	2
N19		XTB35+14A	Screw	5
N20		XTB4+16A	Screw	8
N21		XTW3+8C	Screw	8
N22		XSN4+6	Screw	2
N23		XYN4+C25	Screw with Washer	1
N24		XTW3+10T	Screw	24
N25		XTB4+12A	Screw	4
N26		XTV3+10C	Screw	2
N27		XTT4+30A	Screw	4

■ PACKING PARTS

Ref. No.		Part No.	Description	Per/Set
○ 1		QPGG0185AA	Top Cardboard	1
2		SPHG1730A	Protection Sheet	2
3		SPHG2050A	Polyethylene Bag	2
4		SPHG1490A	Protection Sheet	1
○ 5		QPNG0307AA	Pad	1
6		SPHG1570A	Polyethylene Bag	1
7		QPHG020AA	Protection Sheet	1
8		QPHG033AA	Polyethylene Bag	1
○ 9		QPNG0305AA	Pad	1
○ 10		QPNG0306AA	Pad	1
11		SPHG2200A	Polyethylene Bag	1
12		QPHG028AA	Protection Sheet	1
○ 13		QPGG0165AA	Pad	2
○ 14		QPGG0184AA	Carton	1
15		SPSG40A	Band	2
INSTRUCTION BOOK				
○ 16	EN	QQFGPX73AA	Instruction Book	1
○ 16	M	QQFGPX73CA	Instruction Book	1
○ 16	EZ	QQFGPX73EA	Instruction Book	1
○ 16	EW	QQFGPX73FA	Instruction Book	1
○ 16	Others	QQFGPX73DA	Instruction Book	1

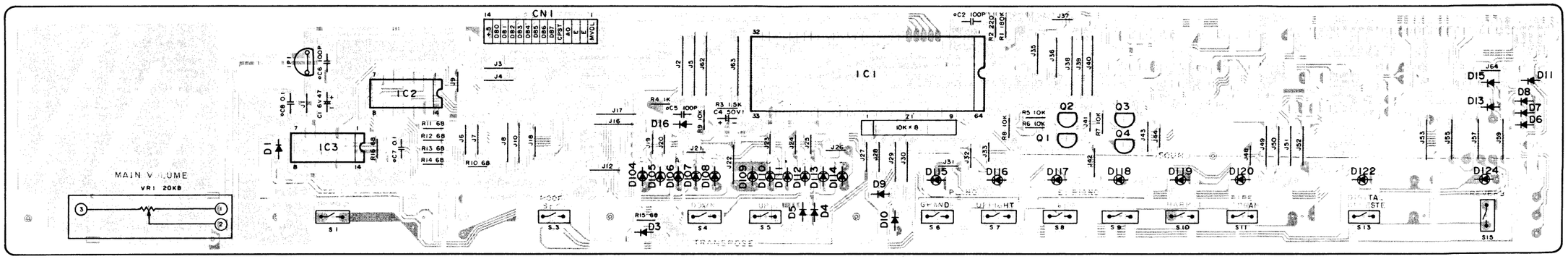
PACKING



CPL CONTROL PANEL CIRCUIT BOARD

CPL

SXPG210341



CPL

NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 3: SVIGM74LS07
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~11, 13, 15, 16: MA165TA5
  - D101~120, 122, 124: LN282R
- IC Protector
  - IP1: ICP-N10T104

REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
○	NLA		SXPG210041	MAIN	1
○	NLA	M MC XM	SXPG211021	TCF	1
○	NLA	EK X XR XS XD XT	SXPG211041	TCF	1
○	NLA	Others	SXPG211011	TCF	1
Ⓢ	NLA		SXPG210231	AS	1
○	NLA		SXPG210821	HP	1
○	NLA		SXPG210341	CPL	1
○	NLA		SXPG209711A	MKB1	1
○	NLA		SXPG209711B	MKB2	1
○	NLA		SXPG209821	JACK	1

MAIN MAIN CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGD70320GJ	16 bit Microcomputer	1
IC2	D65012GF-A79	Gate Array	1
○ IC3	QSIGAPX73AX0	1M bit Programmed EP ROM	1
○ IC4	HM6264ALF10L	64k bit Static RAM	1
IC6, 16, 17	T74H4051AF	8 Channel Multiplexer	3
IC7, 18	M5238FP	Operational Amplifier	2
IC8	M74HC00FP	Quad 2-input NAND Gates	1
IC9	MN73012PGC	Tone Generator LSI 1	1
IC10	MN73013PGD	Tone Generator LSI 2	1
○ IC11	QSIGM3C08113	8M bit Wave ROM	1
IC15	PCM55HP	D-A Converter	1
IC20~24	M5218AFP	Operational Amplifier	5
IC25	LM1894M	Dynamic Noise Reduction	1
TRANSISTORS			
Q1	2SJ105GR	FET	1
S Q2	2SC2320LFG	2SC1310FG (SUB. Part)	1
DIODES			
D1, 2, 4, 5, 7~9	MA165TA5	Diode	7
D6	MA4051MTA	Zener, 5.1V	1
D10, 11	MA4056	Zener, 5.6V	2

Ref. No.	Part No.	Description	Per/Set
OSCILLATORS			
X1	QSXG1A1400A	14MHz, Quartz Oscillator	1
X2	QSXG1B4000B	40MHz, Quartz Oscillator	1
COMPONENT COMBINATIONS			
○ Z1~3, 5~9, 18~20	EXBS8V101J	100Ω×4	11
Z4	EXAMR14A1002	1kΩ/2kΩ, Ladder Network	1
○ Z12~17	EXBS8V472J	4.7kΩ×4	6
COILS & LINE FILTERS			
L1, 15~17, 21, 22	QLQGT1B600MA	Coil	6
L23	QLBG002A	Coil	1
SEMI-FIXED RESISTORS			
VR1	EVSG0E1B103A	10kΩ B,	1
WIRES			
W1	QEXG01001RA	Wire	1
RESISTORS			
R3, 4	ERDS2TJ103	10kΩ	2
R5	ERDS2TJ183	18kΩ	1
R6	ERDS2TJ332	3.3kΩ	1
R7	ERDS2TJ103	10kΩ	1
R8, 9	ERDS2TJ101	100Ω	2
R10	ERDS2TJ472	4.7kΩ	1
R11~13	ERDS2TJ101	100Ω	3
R14, 15	ERDS2TJ102	1kΩ	2
R16	ERDS2TJ154	150kΩ	1
R17	ERDS2TJ104	100kΩ	1
R18	ERDS2TJ103	10kΩ	1
R19	ERDS2TJ473	47kΩ	1
R20	ERDS2TJ101	100Ω	1
R21	ERDS2TJ472	4.7kΩ	1
R22 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
R23	ERDS2TJ472	4.7kΩ	1
R24~28	ERDS2TJ102	1kΩ	5
R29	ERDS2TJ472	4.7kΩ	1
R30	ERDS2TJ101	100Ω	1
R31	ERDS2TJ472	4.7kΩ	1
R32	ERDS2TJ681	680Ω	1
R33	ERDS2TJ472	4.7kΩ	1
R34	ERDS2TJ155	1.5MΩ	1
R35	ERDS2TJ334	330kΩ	1

Ref. No.	Part No.	Description	Per/Set
R36	ERDS2TJ225	2.2MΩ	1
R37	ERDS2TJ102	1kΩ	1
R38	ERDS2TJ332	3.3kΩ	1
R40	ERDS2TJ682	6.8kΩ	1
R41	ERDS2TJ472	4.7kΩ	1
R42	ERDS2TJ105	1MΩ	1
R43	ERDS2TJ104	100kΩ	1
R44~47	ERDS2TJ681	680Ω	4
R48	ERDS2TJ101	100Ω	1
R57	ERDS2TJ473	47kΩ	1
R58	ERDS2TJ683	68kΩ	1
R59	ERDS2TJ823	82kΩ	1
R60	ERDS2TJ124	120kΩ	1
R61	ERDS2TJ334	330kΩ	1
R62	ERDS2TJ224	220kΩ	1
R63	ERDS2TJ334	330kΩ	1
R64	ERDS2TJ124	120kΩ	1
R65	ERDS2TJ823	82kΩ	1
R66	ERDS2TJ683	68kΩ	1
R67	ERDS2TJ473	47kΩ	1
R68	ERDS2TJ224	220kΩ	1
R69	ERDS2TJ393	39kΩ	1
R70	ERDS2TJ224	220kΩ	1
R73	ERDS2TJ393	39kΩ	1
R75	ERDS2TJ224	220kΩ	1
R78	ERDS2TJ393	39kΩ	1
R80	ERDS2TJ224	220kΩ	1
R81, 82	ERDS2TJ683	68kΩ	2
R83	ERDS2TJ124	120kΩ	1
R85	ERDS2TJ683	68kΩ	1
R87	ERDS2TJ124	120kΩ	1
R88	ERDS2TJ683	68kΩ	1
R91, 92	ERDS2TJ104	100kΩ	2
R103, 104	ERDS2TJ104	100kΩ	2
R115	ERDS2TJ472	4.7kΩ	1
R116	ERDS2TJ222	2.2kΩ	1
R117	ERDS2TJ472	4.7kΩ	1
R118~120	ERDS2TJ333	33kΩ	3
R121	ERDS2TJ472	4.7kΩ	1
R122	ERDS2TJ222	2.2kΩ	1
R123	ERDS2TJ472	4.7kΩ	1
R124~126	ERDS2TJ333	33kΩ	3
R127, 128	ERDS2TJ102	1kΩ	2
R129, 130	ERDS2TJ331	330Ω	2
R131	ERDS2TJ681	680Ω	1
R134, 135	ERDS2TJ101	100Ω	2
R136 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
R171, 172	ERDS2TJ104	100kΩ	2
R229, 230 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2
R238	ERDS2TJ103	10kΩ	1
R252	ERDS2TJ331	330Ω	1
R253	ERDS2TJ472	4.7kΩ	1
R256, 257	ERDS2TJ273	27kΩ	2
R258, 259	ERDS2TJ473	47kΩ	2
R260~284	ERDS2TJ221	220Ω	25
CAPACITORS			
C1	ECEA0JKA101	100μF, 6.3V	1
○ C2	ECUV1H104ZFX	0.1μF	1
C3	ECEA1HKN010	1μF, 50V	1
○ C4	ECUV1H104ZFX	0.1μF	1
C6	ECCR1H221J	220pF	1
○ C7	ECUV1H104ZFX	0.1μF	1
○ C13, 14	ECUV1H104ZFX	0.1μF	2
C15	ECEA0JKA470	47μF, 6.3V	1
○ C16, 17	ECUV1H104ZFX	0.1μF	2

Ref. No.	Part No.	Description	Per/Set
C18	ECQV1H474JZ	0.47μF	1
C19	EECF5R5U105	1F, 5.5V, Memory Back-up	1
○ C21	ECUV1H104ZFX	0.1μF	1
C22, 23	ECEA0JKA470	47μF, 6.3V	2
C24	ECCR1H471J	470pF	1
C26	ECCF1H180JC	18pF	1
C27, 28	ECEA1CKA100	10μF, 16V	2
C29	ECEA1CKN100	10μF, 16V	1
C30, 31	ECEA1CKA100	10μF, 16V	2
○ C32	ECUV1H104ZFX	0.1μF	1
C33~38	ECQG1H222KZ	0.0022μF	6
○ C39	ECUV1H104ZFX	0.1μF	1
C40	ECCR1H100D	10pF	1
○ C41	ECUV1H104ZFX	0.1μF	1
C42	ECCR1H100D	10pF	1
C44	ECQG1H222KZ	0.0022μF	1
○ C45	ECUV1H104ZFX	0.1μF	1
C46	ECCR1H100D	10pF	1
C48	ECQG1H222KZ	0.0022μF	1
○ C49	ECUV1H104ZFX	0.1μF	1
C50	ECCR1H100D	10pF	1
C52	ECQG1H222KZ	0.0022μF	1
C53	ECCR1H100D	10pF	1
C54	ECCR1H220J	22pF	1
C55	ECQG1H102KZ	0.001μF	1
C58	ECEA1CKN100	10μF, 16V	1
○ C61	ECUV1H104ZFX	0.1μF	1
C62	ECCR1H220J	22pF	1
C63	ECQG1H102KZ	0.001μF	1
C66	ECEA1CKN100	10μF, 16V	1
○ C69, 70	ECUV1H104ZFX	0.1μF	2
○ C72, 73	ECUV1H104ZFX	0.1μF	2
C74, 75	ECQG1H102KZ	0.001μF	2
C76	ECQG1H222KZ	0.0022μF	1
C77, 78	ECCR1H471J	470pF	2
○ C79	ECUV1H104ZFX	0.1μF	1
C80, 81	ECQG1H102KZ	0.001μF	2
C82	ECQG1H222KZ	0.0022μF	1
C84	ECCR1H471J	470pF	1
○ C85	ECUV1H104ZFX	0.1μF	1
C87	ECEA1HKA010	1μF, 50V	1
C88	ECEA1CKA470	47μF, 16V	1
C89	ECEA1CKA470	47μF, 16V	1
○ C90	ECUV1H104ZFX	0.1μF	1
C91	ECQG1H332KZ	0.0033μF	1
C92	ECQG1H102KZ	0.001μF	1
C93	ECEA1HKA010	1μF, 50V	1
C94	ECQG1H472KZ	0.0047μF	1
C95	ECEA1HKA010	1μF, 50V	1
C96	ECKR1E473ZV	0.047μF	1
C97	ECSF1EE106	10μF, 25V	1
C98	ECQG1H472KZ	0.0047μF	1
C99	ECEA1HKA010	1μF, 50V	1
○ C100	ECUV1H104ZFX	0.1μF	1
C106, 107	ECEA1HKN010	1μF, 50V	2
C109	ECEA1EKA470	47μF, 25V	1
C188, 189	ECEA1EKA470	47μF, 25V	2
C190	ECEA0JKA331	330μF, 6.3V	1
C197, 198	ECCR1H680J	68pF	2
C199, 200	ECCR1H030C	3pF	2
○ C205	ECUV1H104ZFX	0.1μF	1
C207~212	ECRR1H104ZF	0.1μF	6
C220, 221	ECSF1EE106	10μF, 25V	2